

Novell® Sentinel™

6.0

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Volume II - SENTINEL USER'S GUIDE

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Preface

The Sentinel Technical documentation is general-purpose operation and reference guide. This documentation is intended for Information Security Professionals. The text in this documentation is designed to serve as a source of reference about Sentinel's Enterprise Security Management System. There is additional documentation available on the Novell web portal.

Sentinel Technical documentation is broken down into five different volumes. They are:

- Volume I – Sentinel™ 6 Install Guide
- Volume II – Sentinel™ 6 User's Guide
- Volume III – Sentinel™ 6 Collector User's Guide
- Volume IV – Sentinel™ 6 User's Reference Guide
- Volume V – Sentinel™ 3rd Party Integration
- Volume VI – Sentinel™ Patch Installation Guide

Volume I – Sentinel Install Guide

This guide explains how to install:

- Sentinel Server
- Sentinel Console
- Sentinel Correlation Engine
- Sentinel Crystal Reports
- Collector Builder
- Collector Manager
- Advisor

Volume II – Sentinel User's Guide

This guide discusses:

- Sentinel Console Operation
- Sentinel Features
- Sentinel Architecture
- Sentinel Communication
- Shutdown/Startup of Sentinel
- Vulnerability assessment
- Event monitoring
- Event filtering
- Event correlation
- Sentinel Data Manager
- Event Configuration for Business Relevance
- Mapping Service
- Historical reporting
- Collector Host Management
- Incidents
- Cases
- User management
- Workflow

Volume III – Collector User's Guide

This guide discusses:

- Collector Builder Operation
- Collector Manager
- Collectors
- Collector Host Management
- Building and maintaining Collectors

Volume IV - Sentinel User's Reference Guide

This guide discusses:

- Collector scripting language
- Collector parsing commands
- Collector administrator functions
- Collector and Sentinel meta-tags
- Sentinel correlation engine
- User Permissions
- Correlation command line options
- Sentinel database schema

Volume V - Sentinel 3rd Party Integration Guide

- Remedy
- HP OpenView Operations
- HP Service Desk

Volume VI - Sentinel Patch Installation Guide

- Patching from Sentinel 4.x to 6.0
- Patching from Sentinel 5.1.3 to 6.0

Sentinel User Guide Contents

This guide contains the following chapters:

- Sentinel Control Center
- Active Views™ Tab
- Correlation Tab
- Incidents Tab
- iTRAC™ Tab
- Work Item
- Analysis Tab
- Advisor Tab
- Event Source Management
- Admin Tab
- Sentinel Data Manager
- Utilities
- Quick Start
- Appendix A, Sentinel Architecture
- Appendix B, System Events for Sentinel

Conventions Used

Notes and Cautions

NOTE: Notes provide additional information that may be useful.

CAUTION: Cautions provide additional information that may keep you from performing damage or loss of data to your system.

Commands

Commands appear in courier font. For example:

```
useradd -g dba -d /export/home/oracle -m -s /bin/csh
oracle
```

Other Novell References

The following manuals are available with the Sentinel install CDs.

- Sentinel™ Install Guide
- Sentinel™ User's Guide
- Sentinel™ Collector User's Guide
- Sentinel™ User Reference Guide
- Sentinel™ 3rd Party Integration Guide
- Release Notes

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http://support.novell.com/phone.html?sourceidint=suplnav4_phonesup
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http://support.novell.com/support_options.html?sourceidint=suplnav_supportprog
- Patch Download Site: <http://download.novell.com/index.jsp>
- 24x7 support: <http://www.novell.com/company/contact.html>

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1

Sentinel Control Center

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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:

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

Active Views

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

In the Active Views tab, you may:

- 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

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 may:

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

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 may:

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

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 may also run and save an Offline Query for later quick retrieval of search results.

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.

Admin

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

In the Admin tab, you may configure:

- Archive
- Reports
- Events
- Global Filters
- Color Filter
- Mapping
- Menus
- Filters
- Users
- Das Statistics
- Event File Info

- Reporting Data

With Server View Manager you can monitor (Stop/Start/Restart) the processes that Sentinel holds.

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 may:

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

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 may:

- 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.

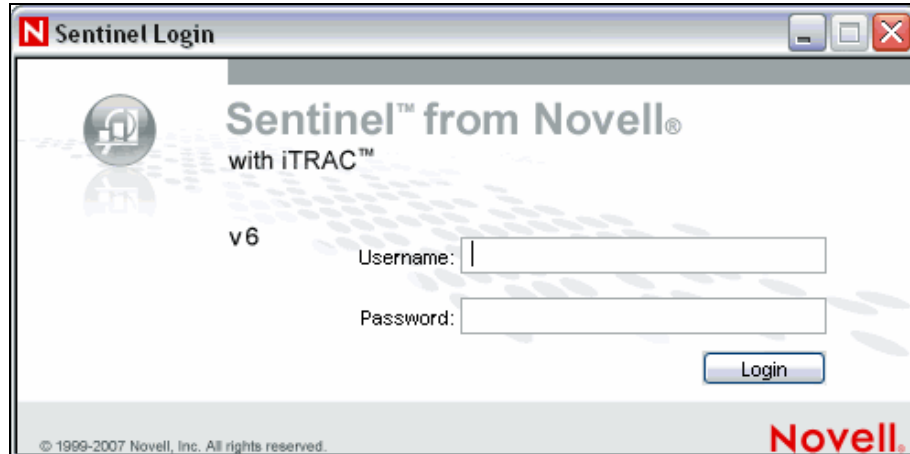
Sentinel Connectors

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

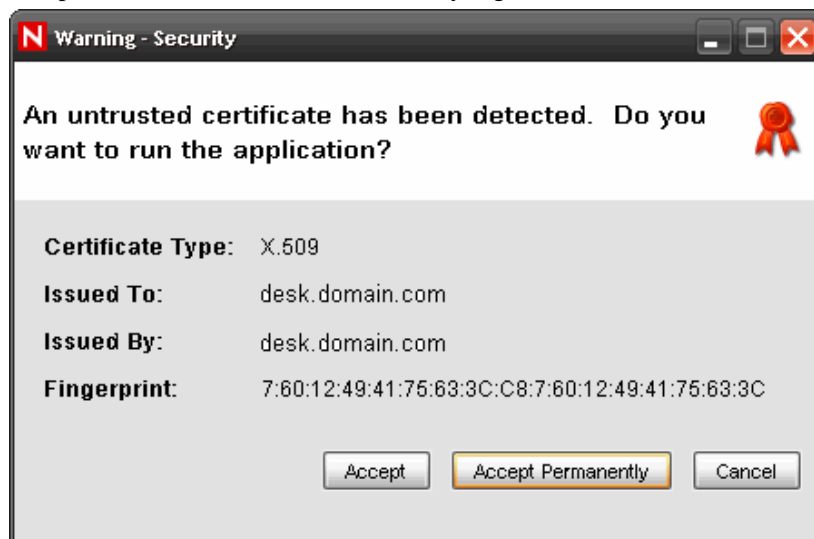
Log in to the Sentinel Control Center

To Start the Sentinel Control Center on Windows:

1. Go to *Start > Programs > Sentinel* and select *Sentinel Control Center*. Sentinel Login window will display.



2. Enter 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 will display. The user must accept the certificate in order to securely log in to the Sentinel Control Center



5. If you select *Accept*, this message will display every time you try to open Sentinel on your system. To avoid this, you may 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`

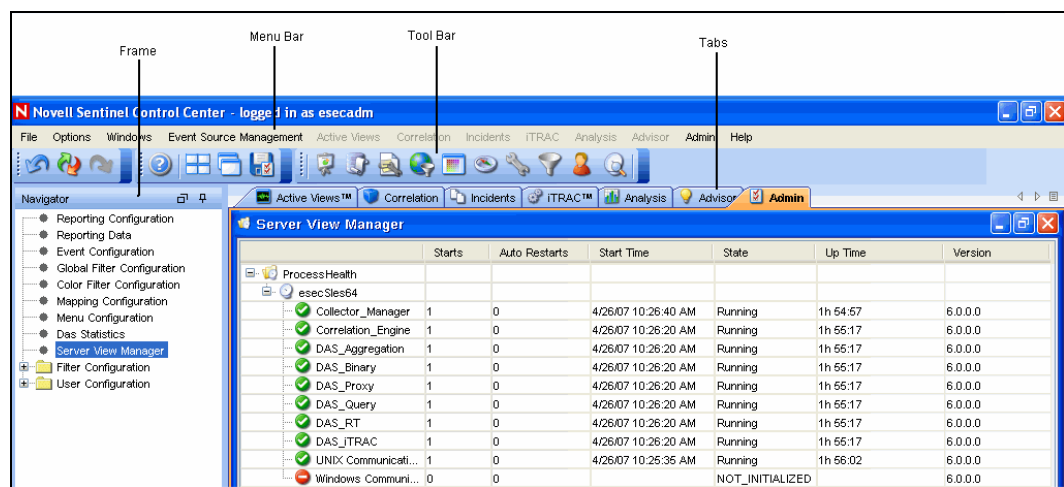
2. Run the following command:
control_center.sh
3. Enter your username and password and click *OK*.
4. A Certificate window will display, if you select *Accept*, this message will display every time you try to open Sentinel on your system. To avoid this, you may select *Accept permanently*.

Introduction to the User Interface

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

- “Menu Bar”
- “Toolbar”
- “Tabs”
- “Frames”

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.



Menu Bar

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



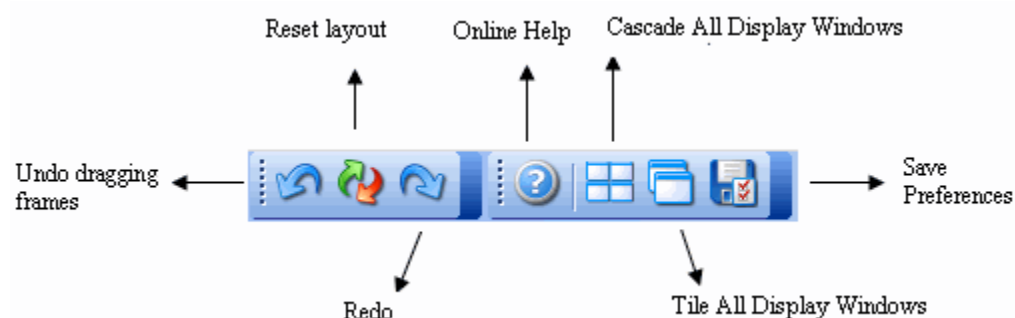
The File, Options, Event Source Management, Windows and Help menus are always available. The availability of other menus depends on your location in the console and permissions.

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.

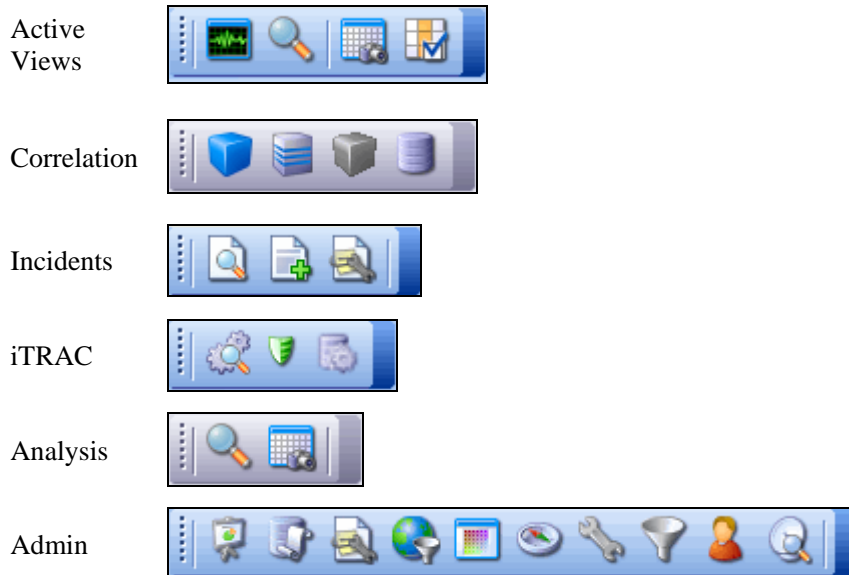
System-Wide Toolbar

The system-wide toolbar buttons are:



Tab Specific Toolbar buttons

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



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

Tabs

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

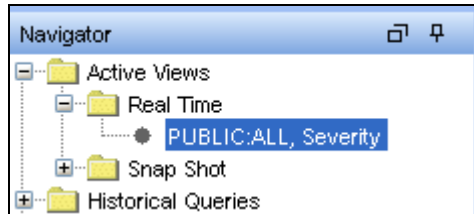
- Active Views™
- Correlation
- Incidents
- iTRAC™
- Analysis
- Advisor
- Admin

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

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, you will see the following buttons which allow you to drag/hide frames.

- Toggle Floating
- Toggle Auto-hide



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 may undo dragging or reset to default position using the toolbar buttons.

Navigating through Sentinel Control Center

To navigate using Toolbar:

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

To navigate using Menu bar:

1. Click on the tab menu in the Menu bar.
2. Select an action you have 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 chapters.

Changing the appearance of Sentinel Control Center

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

- "Setting the Tab Position"
- "Cascading Windows"
- "Tiling Windows"
- "Minimizing and Restoring Windows"
- "Closing all open Windows"
- "Docking or Floating a frame"
- "Showing or Hiding a frame"

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 will 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 will minimize.

To restore windows to original size:

1. Click *Windows > Restore All*. All open windows in the right panel will restore 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*.

Saving User Preferences

If the user has permissions to save their workspace, they may 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 Save User Preferences icon.



Changing Password

To change your Sentinel Control Center password:

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

NOTE: For more information on changing password, see [Setting Password in Best Practices in Sentinel 6.0 Installation Guide](#).

2

Active Views™ Tab

Topics included in this chapter:

<u>Topic</u>	<u>Page</u>
Understanding Active Views	2-1
Viewing Real Time Events	2-4
Sending Messages about Events and Incidents by e-Mail	2-8
Creating Incidents	2-9
Viewing Events that Triggered Correlated Events	2-11
Investigating an Event or Events	2-11
Managing the Columns in a Snapshot or Visual Navigator Window	2-20
Adding Events to an Incident	2-22

Understanding Active Views

The Active Views tab presents events in near-real time. In the Active Views tab, you may:

- 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 6.0 User's Reference Guide](#).

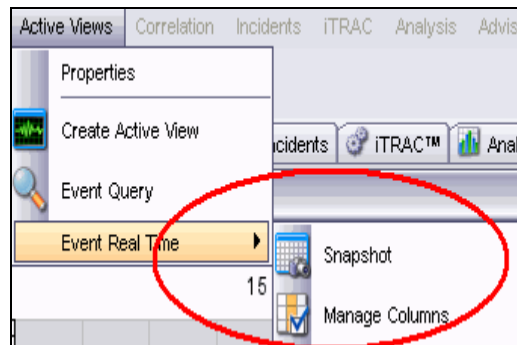
Introduction to the User Interface

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

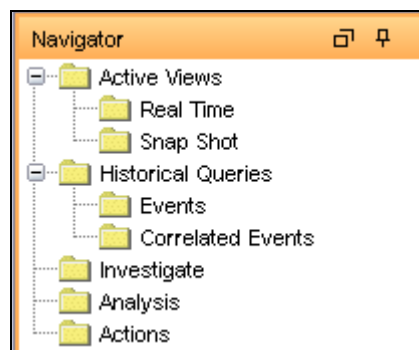
- The Active View menu in the Menu Bar



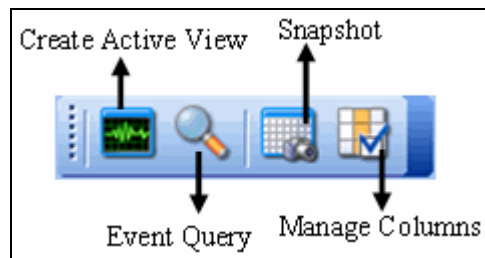
- When you create a filter, The Active View menu has these additional options.



- The Navigation Tree in the Navigation Pane



- The Toolbar Buttons

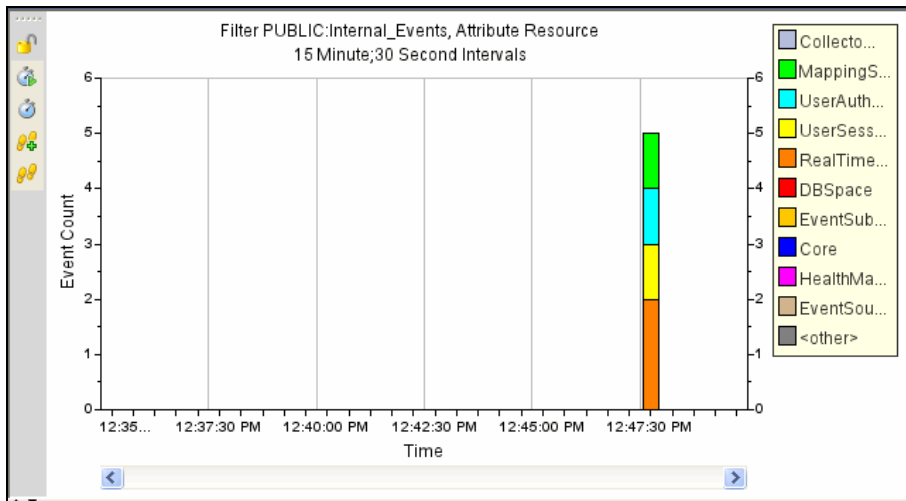


Active Views provides two types of views which display the events in Tables and Graphs.

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.

Severity	EventTime	EventName	EventID	SourceID	Collector
1	5/8/07 12:33:31 PM	DbSpaceLow	B30E4A43-DAB9-1029-9D0A-00123...	A6C489C0-DAB9-1029-9F5C-00123F9...	
2	5/8/07 12:33:31 PM	DbSpaceLow	B30E4A43-DAB9-1029-9D08-00123...	A6C489C0-DAB9-1029-9F5C-00123F9...	
3	5/8/07 12:33:31 PM	DbSpaceLow	B30E4A43-DAB9-1029-9D04-00123...	A6C489C0-DAB9-1029-9F5C-00123F9...	
4	5/8/07 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.



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 will be 30 seconds. This is represented by a gray line in the event table.

1	2005.06.21 / 06:34:38 EDT			Threshold_ex
2	2005.06.21 / 06:34:38 EDT	206.158.21.6	192.168.10.1	Password_ex
3	2005.06.21 / 06:34:28 EDT	190.168.12.21	190.168.12.21	Program_exe

In the event when there are more than 750 per 30-second time period, a red separation line will appear indicating that there are more events than what is displayed.

1	2005.06.21 / 07:07:00 EDT	172.16.112.50	172.16.0.65	unsuccessful
2	2005.06.21 / 07:07:00 EDT	172.16.112.50	172.16.0.65	suspicious-fil
3	2005.06.21 / 07:06:58 EDT	172.16.112.50	172.16.0.65	successful-a

- On saving user preferences, system will continue 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 will display any 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 will display 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”
- “Add Events to an incident”
- “Close a Snapshot or Visual Navigator Window”
- “Create an Incident”
- “Custom Menu Options with Events”
- “Delete a Snapshot or a Visual Navigator Window”
- “Investigate Event Query”
- “Investigate Graph Map”
- “View Advisor Data”
- “Manage Columns”
- “Send messages about Events by e-mail”
- “Show or Hide Event Details”
- “Snapshot of a Visual Navigator Window”
- “View Events that triggered a correlated event”
- “View Vulnerability Visualization”
- “View Asset Data”
- “Ticketing System Integration”

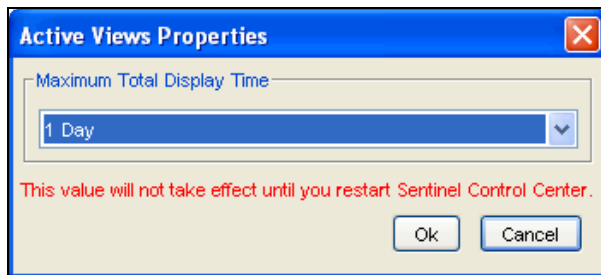
You can change values (column names) to display logical names and have it populate throughout the system. You can apply attributes to the event stream that are relevant to your business. For more information, see [Chapter 11, “Sentinel Data Manager”](#) and *Sentinel 6.0 Collector Builder User's Guide*.

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.

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 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 will allow all events to appear 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.

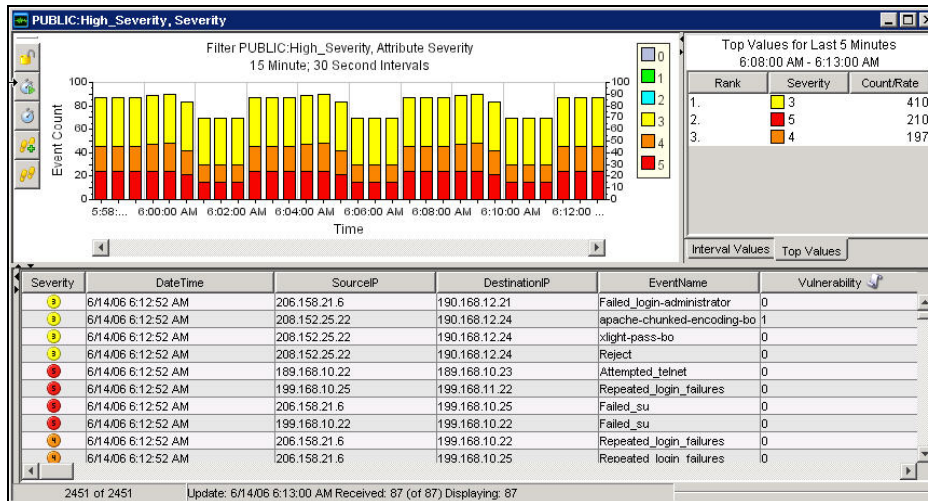
After making your selection, you can click *Next* or *Finish*. If you select *Finish*, the following default values will be chosen:

- 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

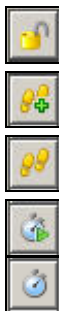
Click *Next*.

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 will look similar to:

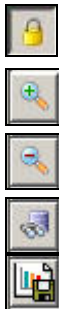


The five buttons to the left of the chart perform the following functions:



- **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.
- **Increase Display Interval:** Increases the display time interval for incoming events
- **Decrease Display Interval:** Decreases the display time interval for incoming events
- **Increase Display Time:** Increase the time interval along the x-axis
- **Decrease Display Time:** Decreases the time interval along the x-axis

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



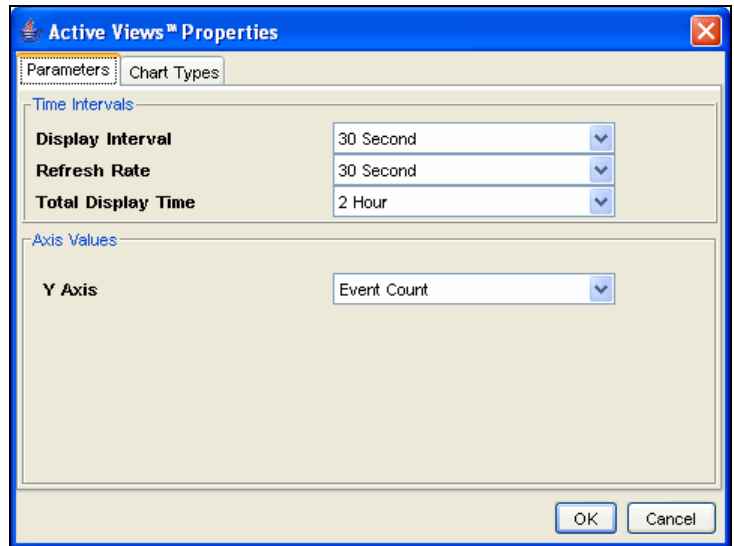
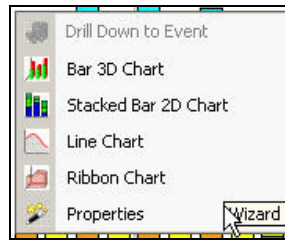
- **Lock/Unlock the Chart:** Used when performing a drill-down, zoom in, zoom out, zoom to selection and saving a chart as an html file.
- **Zoom In:** Zooms in without changing any of the time settings of the chart
- **Zoom Out:** Zooms out without changing any of the time settings of the chart
- **Zoom to Selection:** Zooms in on a selection of time intervals of events.
- **Snapshot Active View:** Save as an html file with chart as images and events in a tabular format.

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:

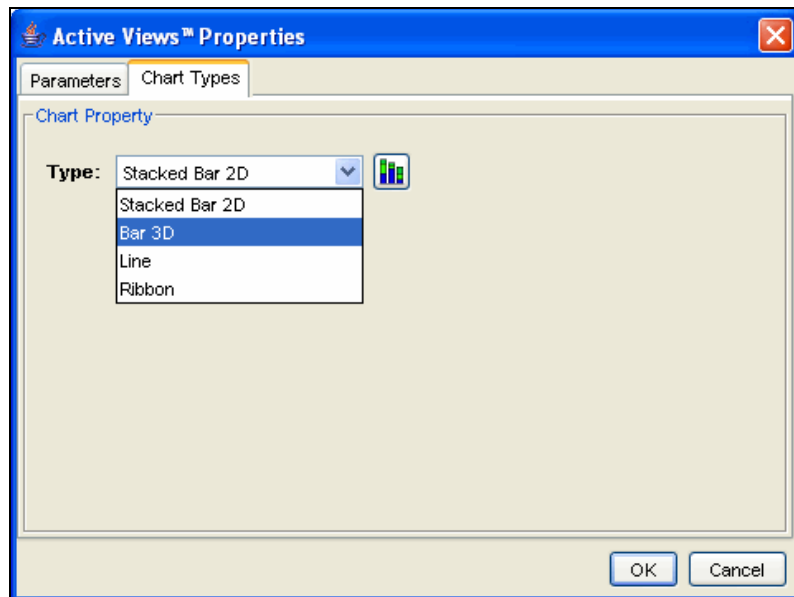
1. Within an Active View displaying a chart, right-click and select *Properties*.



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.



Rotating a 3D Bar or Ribbon Chart

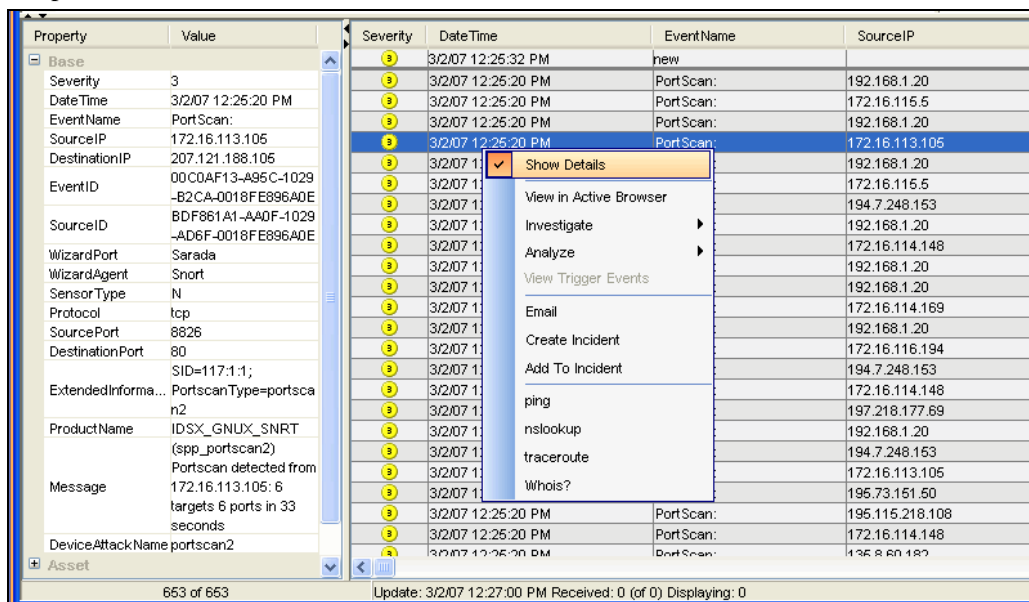
To rotate a 3D bar or ribbon chart:

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

Showing and Hiding Event Details

To show event details:

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



To hide an event detail:

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

Sending Messages about Events and Incidents by e-Mail

Ability to send emails is set in the execution.properties file during installation. This file can be edited after installation. This file is located:

For Windows:

```
%ESEC_HOME%\config
```

For UNIX:

```
$ESEC_HOME/config
```

For more information on configuring email, see the section [“Configuring Sentinel email” in Chapter 12, Utilities.](#)

To send an event message by e-mail:

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

Email Events

Selected Events: 10

ID	Resource	Message
87FF1066-2EF8-1026-...	FRWL_Res	udp drop detected FR...
87FEE73A-2EF8-1026-...	FRWL_Res	udp drop detected FR...
87D83324-2EF8-1026-...	FRWL_Res	tcp drop detected FR...
87D5ADDE-2EF8-1026-...	FRWL_Res	udp drop detected FR...
87AE7B24-2EF8-1026-...	FRWL_Res	tcp drop detected FR...
87AE7B24-2EF8-1026-...	FRWL_Res	tcp drop detected FR...

Email Composition

Email Address:

Email Subject:

Email Message:

Ok Cancel

2. Enter 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 on an Incident.
4. Click *Email Incident*.



5. Enter:
 - Email Address
 - Email Subject
 - Email Message
6. Click *OK*. The e-mail message will have html attachments that address incident details, events, assets, vulnerabilities, advisor information, attachment information, Incident Notes and incident history.

Creating Incidents

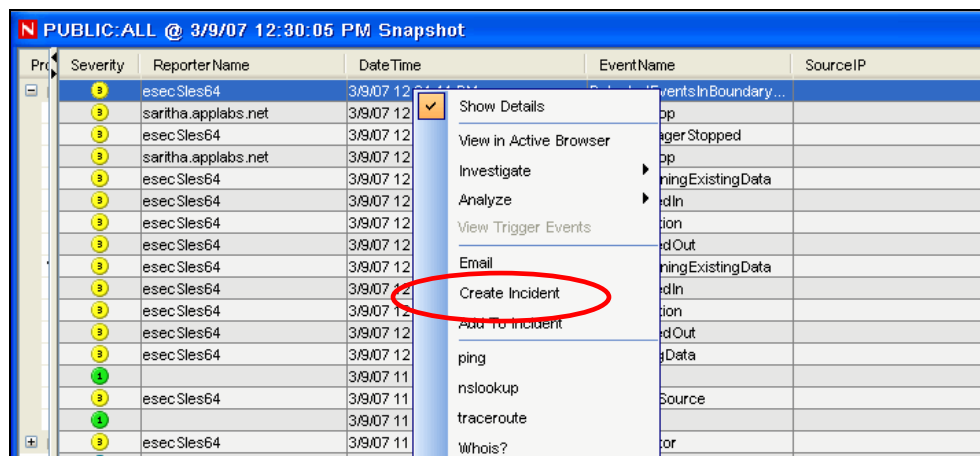
NOTE: To perform this function you must have user permission to create Incident(s).

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 an attack).

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

To create an incident:

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*.



2. In the New Incident Window, you may find the following tabs:
 - **Events:** Shows which events make up the incident
 - **Assets:** Show affected assets
 - **Vulnerability:** Show related asset vulnerabilities
 - **Advisor:** Asset attack and alert information
 - **iTRAC:** Under this tab, you may assign a Workflow (iTRAC)
 - **History:** Incident history
 - **Attachments:** You may attach any document or text file with pertinent information to this incident
 - **Notes:** You may enter any general notes you would need to refer regarding this incident.
3. In the Create Incident dialog box, enter:
 - Title
 - State
 - Severity
 - Priority
 - Category
 - Responsible
 - Description
 - Resolution

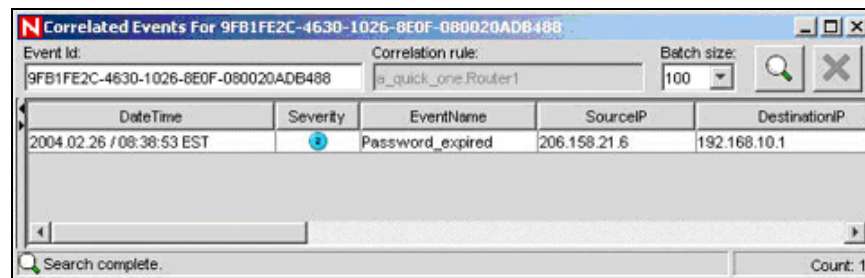
4. Click *Create*. The incident is added under the Incidents tab of the Sentinel Control Center.

Viewing Events that Triggered Correlated Events

You must right-click a correlated event in order to view the events that triggered the correlated event. In the event table from which you are selecting the event, look in the summary display panel on the right for an event that has a property of SensorType with a Value of C (C: correlated event).

To view events that triggered a correlated event:

1. In a Real Time Event Table of the Visual Navigator or Snapshot, or an Event Query table, right-click a correlated event and select View Trigger Events. A window opens showing the events that triggered the rule and the name of the Correlation Rule.



Investigating an Event or Events

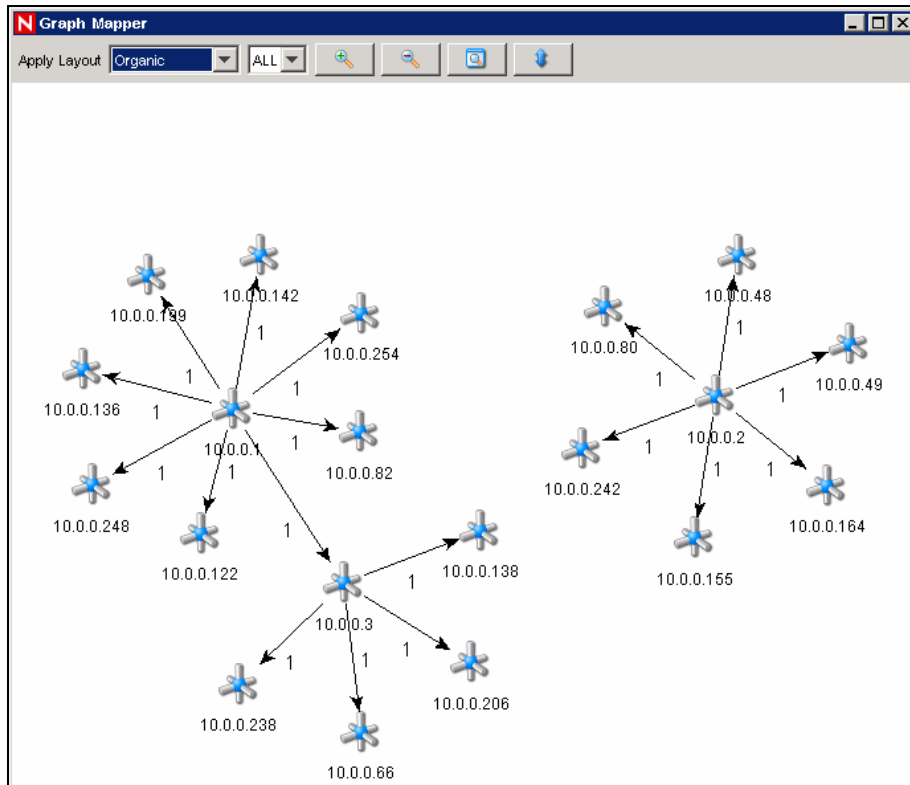
This function allows you to:

- Perform a Event Query for the last hour on a single event for:
 - Destination IP addresses
 - Source IP addresses
 - Event Name

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

- Graphically display the source fields (IP, port, event, sensor type, Collector) mapped to the destination fields (IP, port, event, sensor type, Collector name) of the selected events.

Below is an illustration of source IP addresses mapped to destination IP addresses.



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 12:47:35 AM	10.0.0.2	10.0.0.136	Test Event
4	5/22/07 12:47:04 AM	10.0.0.2	10.0.0.70	Test Event
3	5/22/07 12:46:38 AM	10.0.0.2	10.0.0.203	Test Event
3	5/22/07 12:42:08 AM	10.0.0.2	10.0.0.227	Test Event
3	5/22/07 12:38:41 AM	10.0.0.2	10.0.0.208	Test Event
4	5/22/07 12:38:26 AM	10.0.0.2	10.0.0.120	Test Event
4	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
3	5/22/07 12:36:33 AM	10.0.0.2	10.0.0.203	Test Event
3	5/22/07 12:49:41 AM	10.0.0.2	10.0.0.203	Test Event
5	5/22/07 12:47:45 AM	10.0.0.2	10.0.0.203	Test Event
4	5/22/07 12:42:50 AM	10.0.0.2	10.0.0.203	Test Event
5	5/22/07 12:41:20 AM	10.0.0.2	10.0.0.203	Test Event
5	5/22/07 12:40:38 AM	10.0.0.2	10.0.0.203	Test Event

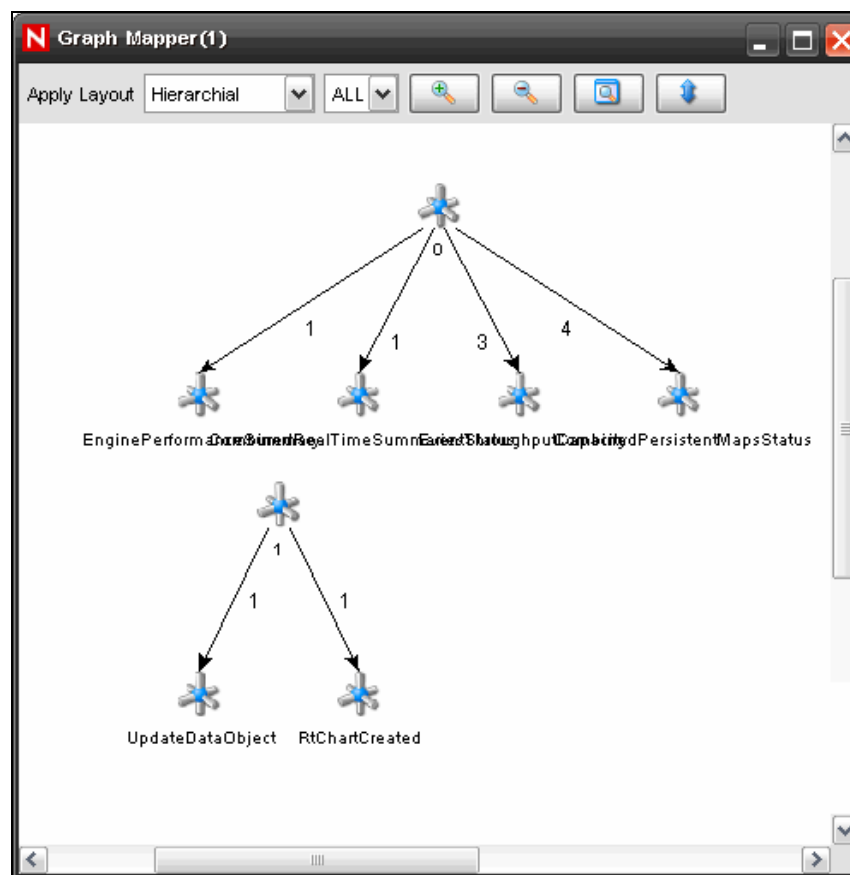
Show Details
View in Active Browser
Investigate
Analyze
View Trigger Events
Email

Show Graph...
Show More Events to this target
Show More Events from this source
What are the target objects of this event?

2. You will need to enter the *From* and *To* IPs and click *Finish*. The graph mapper window will display.

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



Investigate – Event Query

This function allows you to perform Event Query within the last hour.

To perform an Event Query using the Investigate function:

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

Option	Function
Show More Events to this target	Destination IP address
Show More Events to this source	Source IP address
What are the target objects of this event?	Event Name

Active Browser

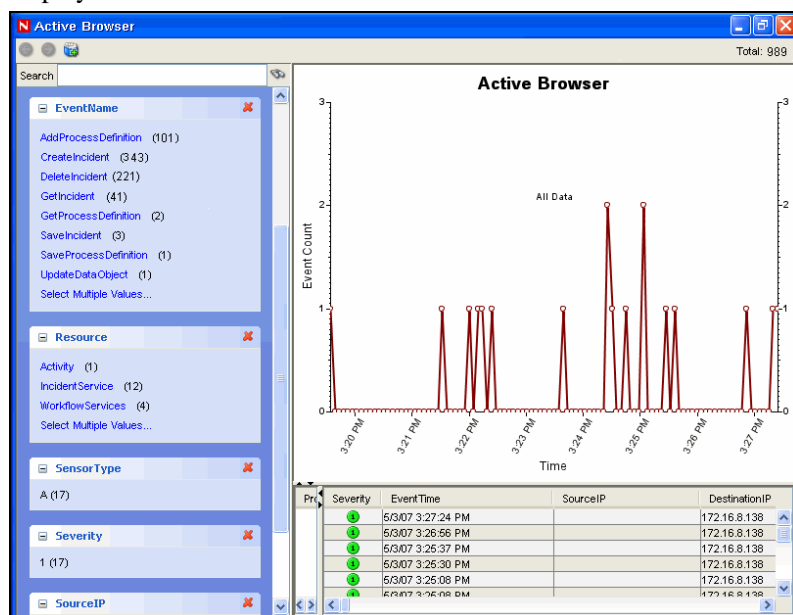
You can view the selected events in the Active Views in active browser. You can perform all the right-click activities that are available in Active Views in Active Browser too. When you open the Active Browser using *Analysis > Offline Query* and click *Browse* against a specific offline query, the events table will be displayed only when the number of events is reduced to less than 1000 by filtering.

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.

To view events in Active Browser:

1. Highlight the event/s you want to view in Active Browser.

2. Right-click events and select *View in Active Browser*. The selected event/s will display in the Active Browser window.



To search in Active Browser:

1. Enter the value or text you wish 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.

Viewing Advisor Data

Advisor provides a cross-reference between real-time IDS attack signatures and Advisor's knowledge base of vulnerabilities. Advisor feed has an alert and attack feed. The alert feed contains information about vulnerabilities and viruses. The attack feed lists the exploits associated with vulnerabilities.

The supported Intrusion Detection Systems are:

- Cisco Secure IDS
- Enterasys Dragon Host Sensor
- Enterasys Dragon Network Sensor
- ISS BlackICE PC Protection
- ISS RealSecure Desktop
- ISS RealSecure Network
- ISS RealSecure Server Sensor
- ISS RealSecure Guard
- Snort/Sourcefire
- Symantec ManHunt
- Symantec Intruder Alert
- McAfee IntruShield

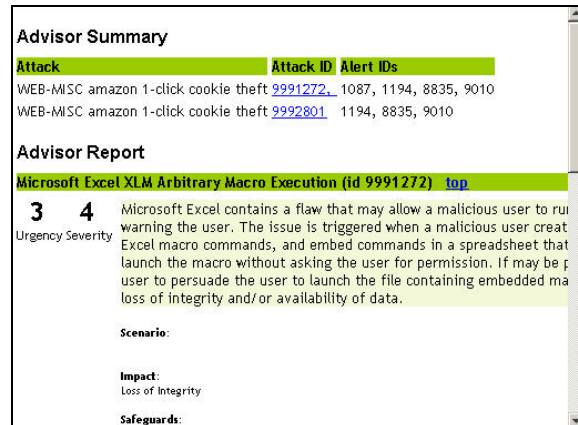
The IDS Collector populates the DeviceAttackName (rt1) field of an event. Advisor uses this information to generate attack and vulnerability information. Some examples of vulnerabilities are:

- FINGER: Cfinger Search Probe
- SMTP: SmartServer3 MAIL FROM Buffer Overflow
- HTTP: Dragon Fire IDS Web Interface Remote Execution
- FTP:MKDIR-DOS
- wh00t-backdoor
- nt-telnet
- FINGER / execution attempt
- tellurian-tftpdnt-filename-bo
- FTP MKD Stack Overflow

- hp-printer-flood

To View Advisor Data:

1. In a Real Time Event Table of the Visual 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 will appear. This example is for a WEB-MISC amazon 1-click cookie theft.



Viewing Asset Data

This function allows you to view and save your view as an HTML file of your Asset Report. 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
- Sensitivity
- Environment
- Location

Network

- IP Address
- Hostname

Software

- Name
- Type
- Vendor
- Product
- Version

Contacts

- Order
- Name
- Role
- Email
- Phone Number

Location

- Room
- Rack
- Address

To view Asset Data:

1. In a Real Time Event Table of the Visual Navigator or Snapshot window, right-click an event or events>*Analyze>Asset Data*. Window similar to the one below will appear.

Asset Report						
Hardware	MAC Address	04:23:A3:44:65:87				
	Name		Value	UNKNOWN		
	Type	DESKTOP	Criticality	UNKNOWN		
	Vendor	UNKNOWN	Sensitivity	UNKNOWN		
	Product		Environment	UNKNOWN		
	Version		Location	UNKNOWN		
Network	IP	Hostname				
	192.168.0.10 devbox10					
Software	Name		Type	Vendor	Product	Version
Contacts	Order	Name		Role	Email	Phone Number
		OwnerFirstName10	OwnerLastName10	ASSET_OWNER	OwnerEmail10	OwnerPhoneNumber10
		MaintainerFirstName10		ASSET_MAINTAINER	MaintainerEmail10	MaintainerPhoneNumber10
		MaintainerLastName10				
		BusinessUnit10		BUSINESS_UNIT		
		LineOfBusiness10		LINE_OF_BUSINESS		
		Division10		DIVISION		
		Department10		DEPARTMENT		
Location	Room	709				
	Rack	10				
	Address	HQ 1921 Gallows Rd Suite 700 Vienna VA 22182 USA				
Hardware	MAC Address	04:23:A3:44:65:78				
	Name		Value	AssetValue		
	Type	DESKTOP	Criticality	Criticality		
	Vendor	Vendor	Sensitivity	Sensitivity		
	Product	ProductName	Environment	EnvironmentIdentity		
	Version	ProductVersion	Location	NetworkIdentity		
Network	IP	Hostname				
	192.168.0.1					

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 [Novell 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.

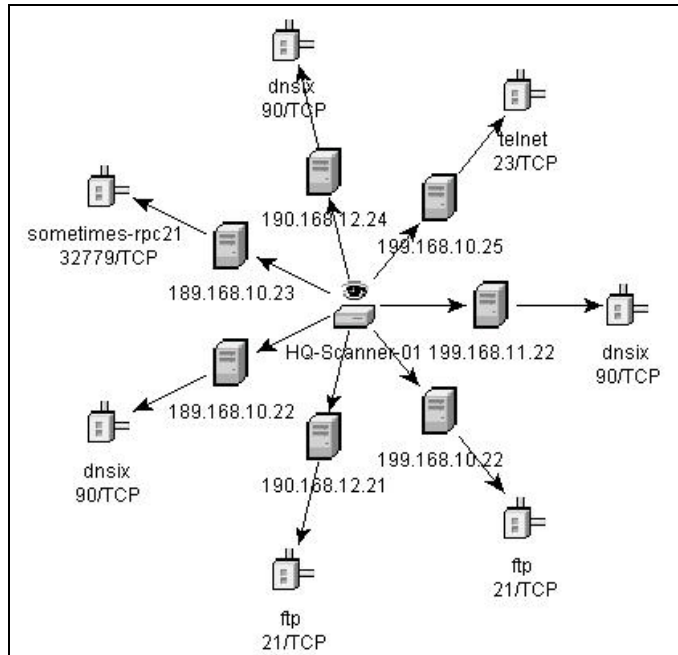
NOTE: Vulnerability Collectors are distinct from Event Collectors and use different commands.

There are several Vulnerability Visualization views:

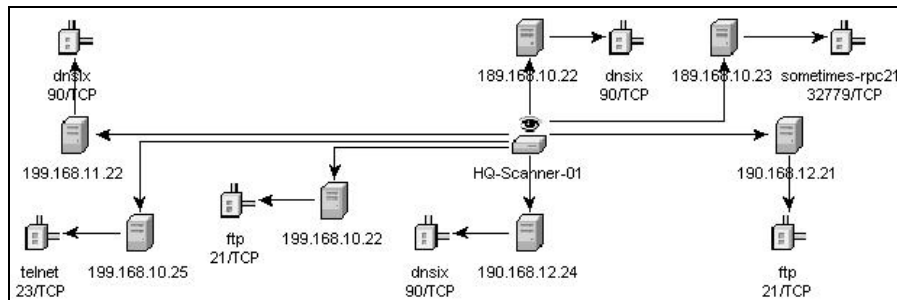
- HTML
- Graphical
 - Circular
 - Organic
 - Hierarchical
 - Orthogonal

The HTML view is a report view that lists relevant fields, depending on which vulnerability scanner you have:

- IP
- Host
- Vulnerability
- Port/protocol



Circular



Orthogonal

In the graphical display there are four panels. They are:

- Graph panel
- Tree panel
- Control panel
- Details/events panel

The graph panel display associates vulnerabilities to a port/protocol combination of a resource (IP address). For example, if a resource has five unique port/protocol combinations that are vulnerable, there will be five nodes attached to that resource. The resources are grouped together under the scanner that scanned the resources and reported the vulnerabilities. If two different scanners are used (ISS and Nessus), there will be two independent scanner nodes that will have vulnerabilities associated with them.

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.

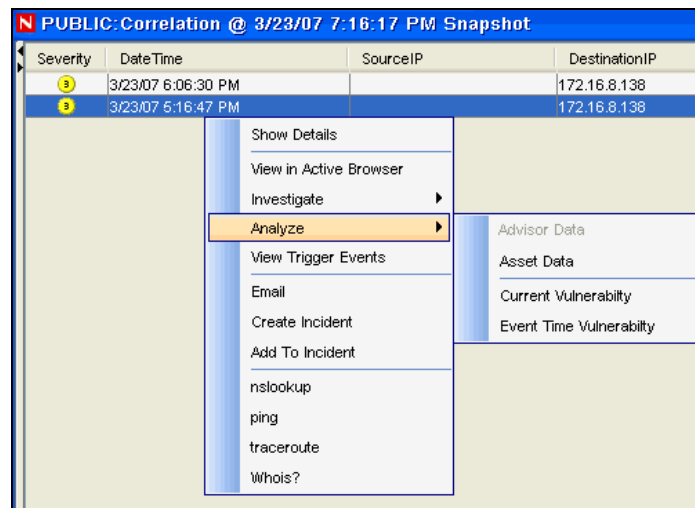
The control panel exposes all the functionality available in the display. This includes:

- 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

In the Details/Events panel, you have two tabs. When in the Details tab, clicking on a node will result in displaying node details. When in the Events tab, clicking on an event associated with a node the node will display 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 Visual 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 on 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

Ticketing System Integration

Novell provides optional integration modules for HP Service Desk or 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 Service Desk or Remedy. Updates in Service Desk and Remedy will then be sent back to the Sentinel Control Center so Sentinel users know when the issue's status changes.

For more information about sending incidents and events to an external ticketing system, see *3rd Party Integration Guide*.

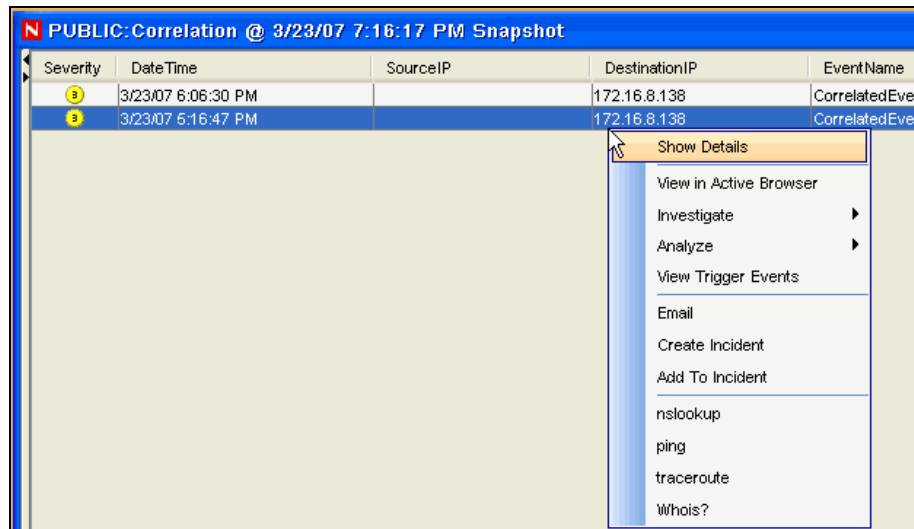
NOTE: The permission to create Service Desk or Remedy incidents is controlled by the administrator on a user-by-user basis.

Using Custom Menu Options with Events

To use a custom menu option with an event:

1. In an existing Real Time Event Table of the Visual Navigator or Snapshot, select an event or a group of events and right-click to select an option. The default custom menu options are as follows:
 - ping
 - nslookup
 - tracert
 - Whois?

You can further assign user permission to View Vulnerability and to perform HP Actions. You can add options using the Menu Configuration window that's available in the Admin tab.



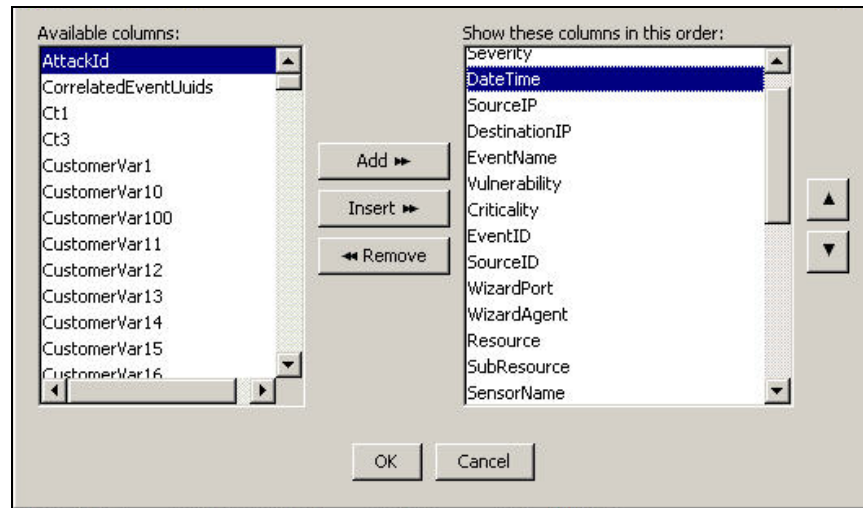
Managing the Columns in a Snapshot or Visual Navigator Window

To select and arrange columns in a Snapshot or Visual Navigator:

1. With a Snapshot or Visual 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.



Taking a Snapshot of a Visual Navigator Window

To perform this function you must have user permission Snapshot.

This is useful to study events of interest since the Visual Navigator refreshes automatically and the alert or alerts of interest may 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 Visual 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.

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.

Closing a Snapshot or Visual Navigator

To close a Snapshot or a Real Time Event Table:

1. With a Snapshot or Visual 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).

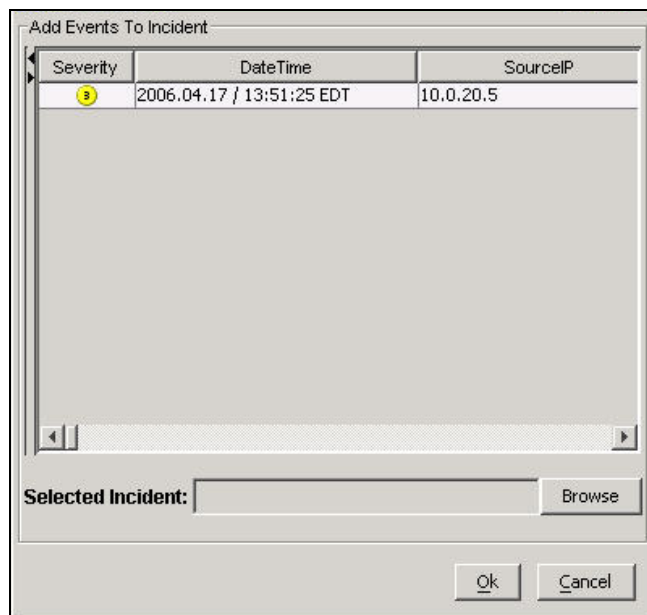
NOTE: The view or snapshot will not redisplay when you close and reopen the Sentinel Control Center.

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 will display. Click *Search* to view a list of incidents. List of incidents of selected criteria will display.

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

Select Data

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

Search Add Cancel

Show items that match these criteria:

<Add criteria from below to this list>

Remove

Define more criteria:

Relations

None

Field Condition Value

None None

Add to List

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 due to a lag in the time between display in the Real Time Events window and insertion into the database. If this occurs, it may take a few minutes for the original events to finally be inserted into the database and display in the incident.

3

Correlation Tab

Topics included in this chapter:

<u>Topic</u>	<u>Page</u>
Understanding Correlation	3-1
Introduction to the User Interface	3-3
Correlation Rules	3-3
Dynamic Lists	3-15
Correlation Action Manager	3-18

Understanding Correlation

Sometimes, an event viewed in the system may not necessarily draw your attention. But, when you correlate a set of similar or comparable events in a given period, it may 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 will allow 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

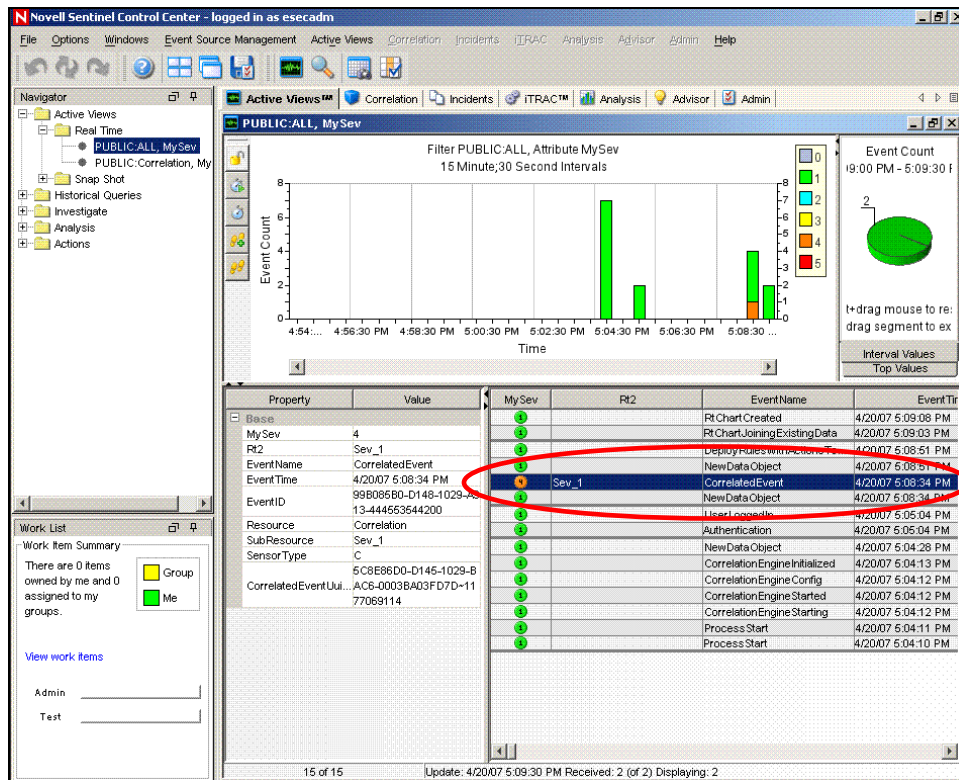
Two or more of these rules can be combined into one composite rule. The rule definition will determine the conditions under which the composite rule will fire:

- 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. Once the rule is deployed, the Correlation Engine will process 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 will not be 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.



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

Technical Implementation

All correlation is done in-memory on the machine (or machines) that host the correlation engine. This model allows for 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 may 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 may use an NTP (Network Time Protocol) server to synchronize the time on all devices on your network, or you may 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 logon" from two devices are classified the same.

In the Correlation tab, you have the ability to:

- Create/Modify Correlation rules and rule folders
- Deploy Correlation rules on Correlation Engine

- Create and associate an action to a role
- Configure Dynamic lists

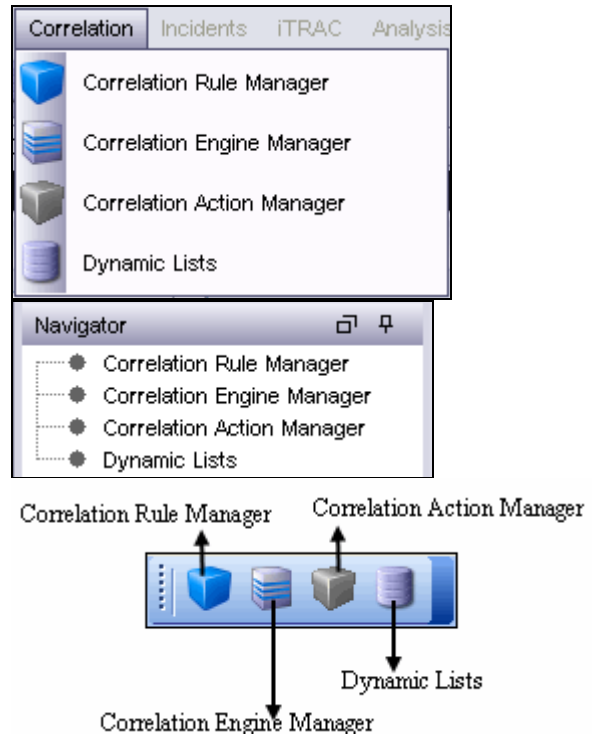
NOTE: Access to the correlation functions can be enabled by the administrator on a user-by-user basis.

Introduction to the User Interface

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

You may navigate to these functions from:

- The Correlation menu in the Menu Bar
- The Navigation Tree in the Navigation Pane
- The Toolbar Buttons



Correlation Rules

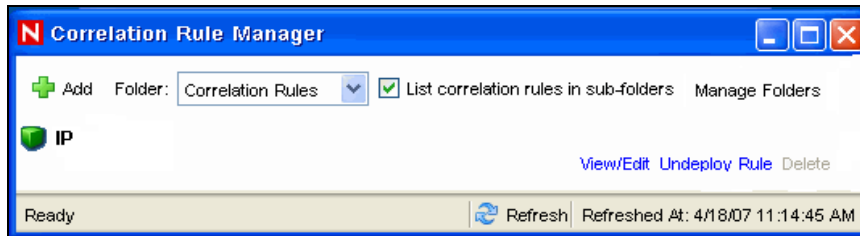
Correlation Rules are created, modified, renamed, deployed/undeployed in the Correlation Rule Manager. Correlation Rules are organized into Rule Folders, which can also be managed in the Correlation Rule Manager.

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 will overwrite all previous saves.

Opening the Correlation Rule Manager

To open the Correlation Rules Manager:

1. Click the *Correlation* tab.
2. In the navigator, click *Correlation Rules Manager*. Alternatively, click *Correlation Rules Manager* button in the Tool Bar. The following window will display.



Creating a Rule Folder

To create a Rule Folder:

1. Open the Correlation Rules window and click *Manage Folder*.
2. Highlight and right-click on a folder and select *Add Folder*.
3. Type in the Rule Folder name.

Renaming a Rule Folder

To rename a Rule Folder:

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

Renaming 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 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 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 *Delete* link. Click *Yes* when the system asks for confirmation.

Moving a Correlation Rule

To move a Correlation Rule:

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

Creating a Correlation Rule

To create a Correlation Rule:

1. Open the Correlation Rules window and select a folder from the Folder drop-down list to which this rule will be added.
2. Click *Add* button located on the top left corner of the screen.
3. The Rule Wizard opens. 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 will fire 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 will fire only once as per user-defined time period. All the other events that match the correlation rule within the specified time will be grouped together with this correlated event. This user-defined time period may be a certain number of seconds, minutes, or hours.
5. Click *Next*.
6. Enter 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 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.

Correlation Rule Types

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

NOTE: While creating a Rule, you may add a dynamic list to it. For more information, see “[Associating Dynamic List with Correlation Rule](#)”.

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 may be intersected (using the “all” option in the GUI or the “AND” operator in RuleLG) or the filter criteria may 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.

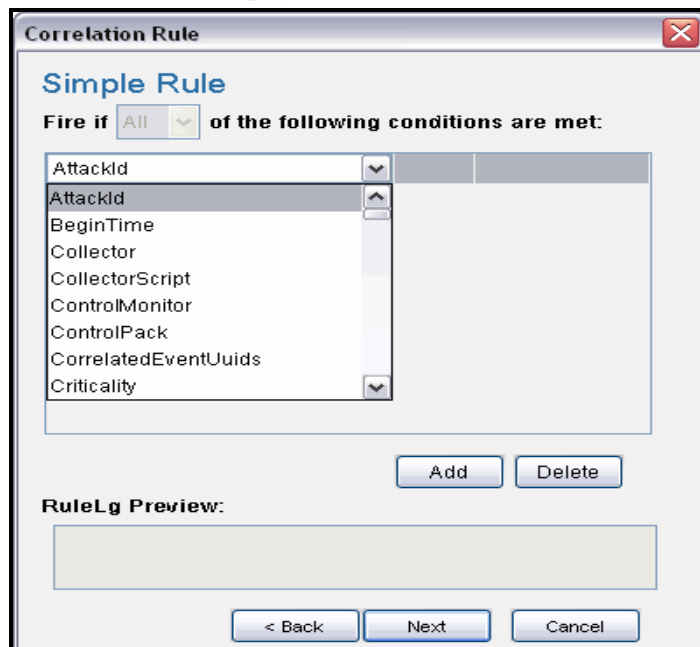
A simple rule requires only one event in order to fire.

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 [the Sentinel Correlation Engine RuleLG Language in Sentinel 6.0 User's 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 window and select a folder from the drop-down list to which this rule will be added.
2. Click the *Add* button located on the top left corner of the screen. The *Correlation Rule* window will display. Select *Simple Rule*.



The screenshot shows the 'Correlation Rule' dialog box with the 'Simple Rule' tab selected. The 'Fire if' dropdown is set to 'All'. Below it, a list of properties is shown: AttackId, AttackId, BeginTime, Collector, CollectorScript, ControlMonitor, ControlPack, CorrelatedEventUids, and Criticality. The 'AttackId' property is selected. To the right of the list are 'Add' and 'Delete' buttons. Below the list is a 'RuleLg Preview' section with a text area. At the bottom are '< Back', 'Next', and 'Cancel' buttons.

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

Correlation Rule

Simple Rule

Fire if **All** of the following conditions are met:

Severity = 3

Add Delete

RuleLG Preview:

filter(e.Severity = 3)

< Back Next Cancel

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 will display.

Correlation Rule

Update Criteria

After rule fires:

☐ Continue to perform actions every time this rule fires

☒ Do not perform actions every time this rule fires for the next 1 second(s)

< Back Next Cancel

6. Update criteria for the rule to fire and click *Next*. The General Description window will display.

Correlation Rule

General Description

Name

Severity

Namespace

Correlation Rules

Description

< Back Next Cancel

7. Enter a name to this rule. You have an option to modify the rule folder.
8. Enter 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 may 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 may 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 may also use the “discriminator” operator to define the group by field. For more information about RuleLG, see [the Sentinel Correlation Engine RuleLG Language in Sentinel 6.0 User's Reference Guide](#).

To create an aggregate rule:

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

Correlation Rule

Aggregate Rule

Sub Rules:

filter: Severity=2

Add Rule View/Edit Rename Delete

For Aggregate Rule to fire:

The pattern should match 1 times within 1 Minute(s)

Group by these event tags in the following order:

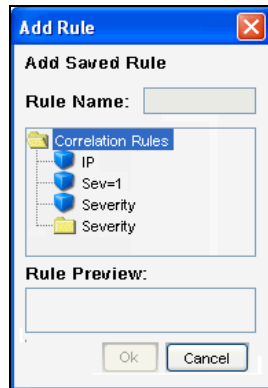
Add/Edit

RuleLg Preview:

filter(e.Severity = "2") flow trigger(1,60)

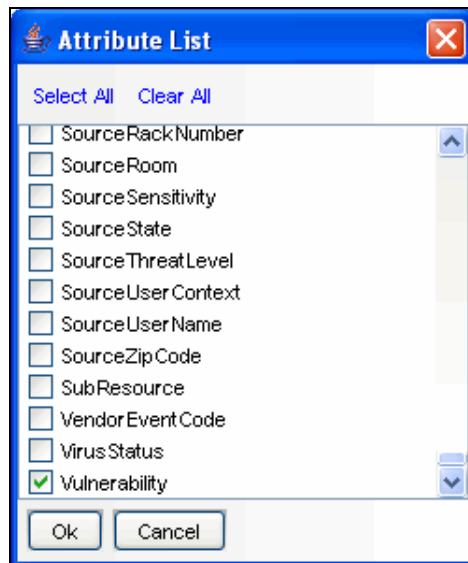
Edit RuleLg < Back Next Cancel

3. In Aggregate Rule window, you may select a sub-rule to create an aggregate rule. To select a sub-rule, click *Add Rule* button. Add Rule window will display.



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 Window will open.



7. Check the attribute as per your requirement. You can preview the rule in the RuleLG preview window. Click *Next*. The Update Criteria window will display.
8. Update the criteria for the rule to fire and click *Next*. The General Description window will display.
9. Enter a name to this rule. You have an option to modify the rule folder.
10. Enter 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 may 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 may 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 window and select a folder from the drop-down list to which this rule will be added.
2. Click the *Add* button located on the top left corner of the screen. The *Correlation Rule* window will display. Select *Composite Rule*.

The screenshot shows the 'Correlation Rule' window with the 'Composite Rule' tab selected. The 'Sub Rules' section contains a list with two items: 'filter: IP' and 'filter: Begin-End Time'. Below the list are buttons for 'Add Rule', 'View/Edit', 'Rename', and 'Delete'. The 'For Composite Rule to fire:' section has two radio button options: 'All sub-rules should fire within 1 Minute(s) of each other' (selected) and 'Any 1 sub-rules should fire within 1 Minute(s) of each other'. The 'Group by these event tags in the following order:' section shows 'Severity,Vulnerability' in a text box with an 'Add/Edit' button. The 'RuleLg Preview:' section displays a complex logical expression: `gate(filter(e.BeginTime = 1176698624 and e.Severity >= "1"),filter(e.BeginTime = 1176796322 and e.EndTime = 1176882741),any,60,discriminator(e.Severity,e.Vulnerability))`. At the bottom are buttons for 'Edit RuleLg', '< Back', 'Next', and 'Cancel'.

3. In Composite Rule window, you may select sub-rules to create a composite rule. To select a sub-rule, click *Add Rule* button. Add Rule window will display.
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 will display.
7. Check the attribute as per your requirement. You may preview the rule in RuleLg preview box. Click *Next*, the Update Criteria window will display.
8. Update criteria for the rule to fire and click *Next*.
9. Enter a name to this rule. You have an option to modify the rule folder.
10. Enter 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 may 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 window and select a folder from the Folder drop-down list to which this rule will be added.
2. Click the *Add* button located on the top left corner of the screen. The *Correlation Rule* window will display. Select *Sequence Rule*.

The screenshot shows the 'Correlation Rule' dialog box with the 'Sequence Rule' tab selected. It features a list of sub-rules with 'filter: IP' and 'filter: Sev=1'. Below this are buttons for 'Add Rule', 'View/Edit', 'Rename', and 'Delete'. A section for timing specifies 'All sub-rules should fire within 1 Minute(s) of each other'. There is a section for grouping by event tags with the text 'Criticality,Severity,Vulnerability' and an 'Add/Edit' button. A 'RuleLg Preview' box displays a sequence rule definition. At the bottom are 'Edit RuleLg', '< Back', 'Next', and 'Cancel' buttons.

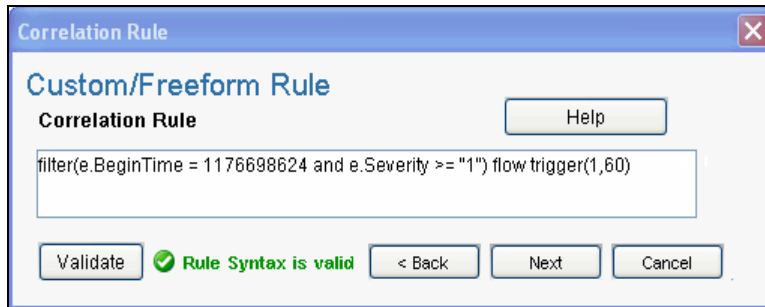
3. In Sequence rule window, you may select a sub-rule to create a sequence rule. To select a sub-rule, click *Add Rule* button. Add Rule window will display.
4. Select a rule and click *OK*.
5. Set parameters for the rule to fire. To group event tags according to the attributes, Click *Add/Edit*. The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

To create a custom or freeform rule:

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



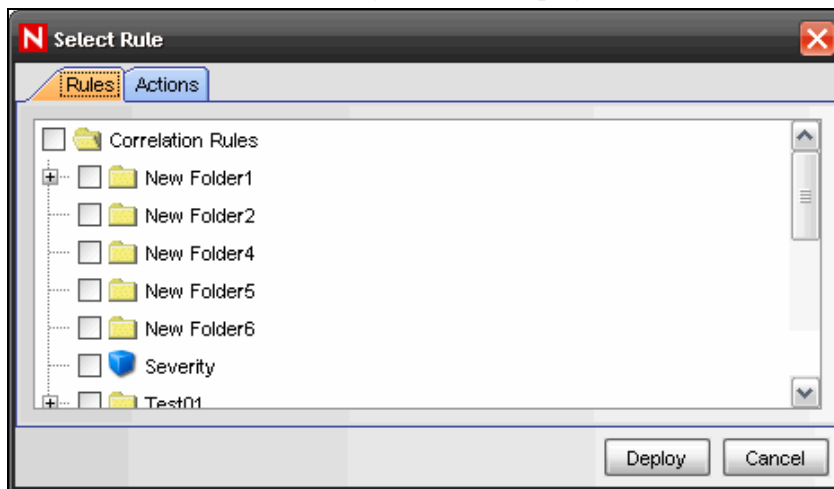
3. In the Custom/Freeform Rule window, write the condition for the rule and click *Validate* to test the validity of the rule.
4. On successful validation of the rule, click *Next*, the Update Criteria window will display.
Update the criteria for the rule to fire and click *Next*.
5. Enter a name to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

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.

To deploy Correlation Rules (in Correlation Engine Manager):

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

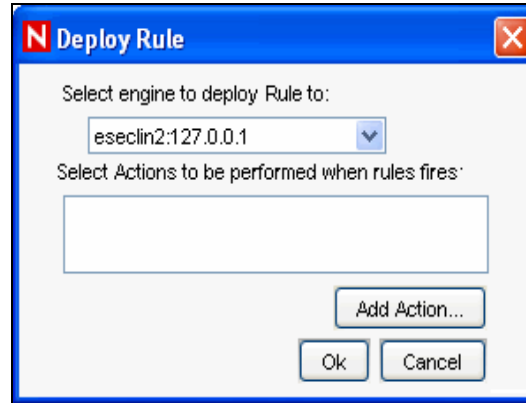


NOTE: By default, rules deployed are in enabled state.

4. In the Actions tab, check the action you want to associate with the rule and click *Deploy*.

To deploy Correlation Rules (in Correlation Rule Manager):

5. Open the Correlation Rule Manager window.
6. Highlight a rule and click *Deploy rules* link. The Deploy Rule window will display.



7. In the Deploy rule window, select the Engine to deploy the rule from the drop-down list.
8. [Optional] Select an action or add a new action. If nothing is selected, a Correlated Event with default values will be created.
9. Click *OK*.

To Undeploy a Single Rule:

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

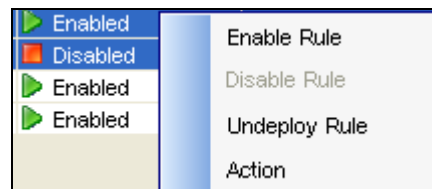
To Undeploy All Correlation Rules:

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

Enabling/Disabling Rules

To Enable/Disable Rule:

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



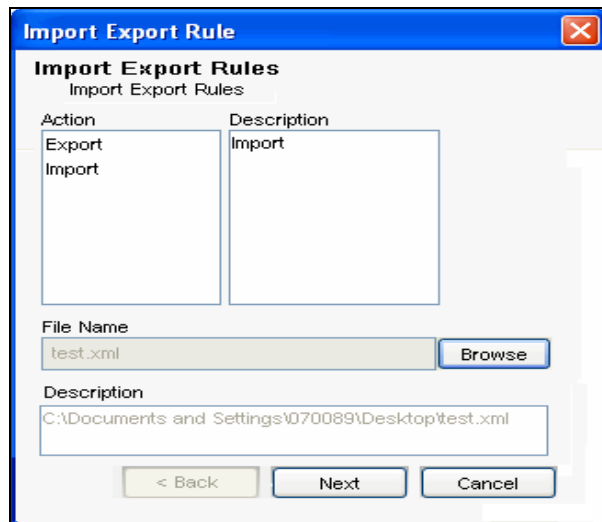
Importing a Correlation Rule

To Import a Correlation Rule:

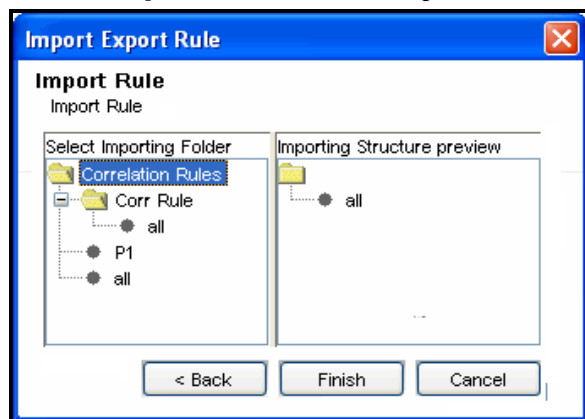
1. Open the Correlation Rules window and click *Import/Export Correlation Rule* icon.



The Import Export Rule window will display.



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 will display.



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

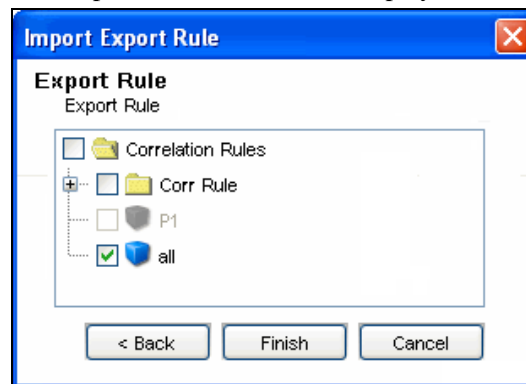
NOTE: While importing a correlation rule in a folder, if the correlation rule with the same name exists, the system will prompt and will not import the file.

Exporting a Correlation Rule

To Export a Correlation Rule:

1. Open the Correlation Rules window and click *Import/Export Correlation Rule* icon. The Import Export Rule window will display.

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. Enter a file name and click *Export*. Click *Next*. The Export Rule window will display.



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

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 may be added to the list manually (by an administrator) or automatically whenever a correlation rule fires. Elements may 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.

Regardless of how the values were added, they may 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.

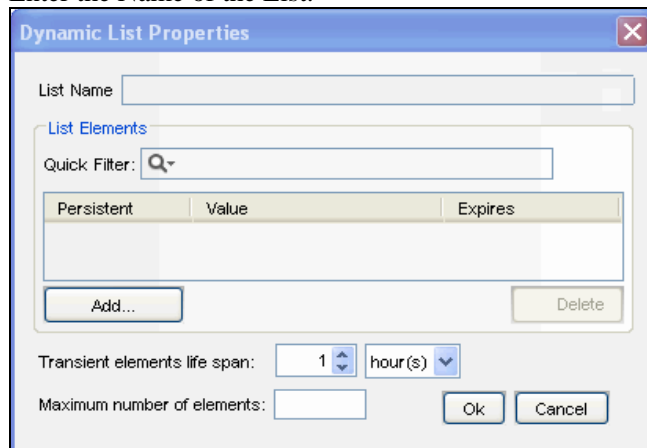
NOTE: If the Time to Live period is updated on an active Dynamic List, the change is not retroactive to elements already on the list. Elements that have already been added to the dynamic list will retain their original Time to Live.

Adding a Dynamic List

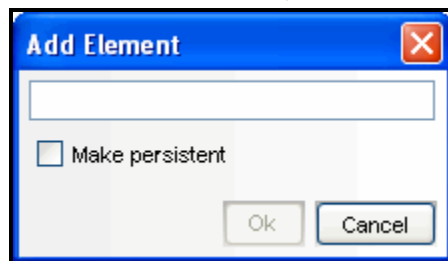
To add Dynamic Lists:

1. Click *Correlation* on the Menu Bar and select *Dynamic Lists*. Alternatively, you can click on the Dynamic Lists button on the Tool Bar.
2. Click *Add* button located on the top left corner of the screen. Dynamic List Properties window will display.

3. Enter the Name of the List.



4. Click *Add*. The following windows will display:



5. Enter 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 will be active in the list
7. Enter the Maximum Number of Elements. The number defined here will limit the number of elements in the list.
8. Click *OK*.

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

Modifying a Dynamic List

To edit a Dynamic List:

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

Deleting a Dynamic List

Caution: 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 on the Dynamic Lists button on the Tool Bar.
2. Select a Dynamic List and click *Delete* link against it. Confirmation message alert will display.
3. Click *Yes* to delete.

Removing Dynamic List Elements

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

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

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`

To add a Dynamic List to correlation rule:

1. In the Dynamic List window, **“create a dynamic list”**.
2. Open the Correlation Rules window and select a folder from the drop-down list to which this rule will be added.
3. Click the *Add* button located on the top left corner of the screen. The Correlation Rule window will display. Select *Custom/Freeform Rule*.
4. 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.
5. Click *Validate* to test the validity of the rule.
6. On successful validation of the rule, click *Next*, the Update Criteria window will display.
7. Update the criteria for the rule to fire and click *Next*.
8. Enter a name to this rule. You have an option to modify the rule folder.
9. Enter rule description and click *Next*.
10. 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  and 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 will not be reflected in the Correlation Engine until one of the following things happens:

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

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 on a *Correlation Engine* and select *Start or Stop Engine*.



Renaming Correlation Engine

A Sentinel system may 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 on the Correlation Engine and select *Rename Engine*.
3. Modify the name of the Engine and click *OK*.

Correlation Action Manager

Correlation Actions allow you to configure repeatable actions that can be associated with a rule deployment so that one or more of the actions is performed whenever the deployed correlation rule fires. The Correlation Action Manager allows you to create and configure these actions.

Correlation Action Types

The Correlation 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

Each action type has a set of configurable parameters.

One or more of these action types can be associated with a correlation rule when the correlation rule is deployed. If none of these action types are selected, a correlated event will be created by default. When a default correlation event is triggered, it will have the following values:

Field Name	Default Values
Severity	4
Event Name	CorrelatedEvent
Message	<empty>
Resource	Correlation
SubResource	<Rule Name>

Configure Correlated Event

The screenshot shows the 'Configure Action' dialog box. The 'Action' dropdown menu is set to 'Configure Correlated Event'. Below this, there is a table with two columns: 'Name' and 'Value'. The table is divided into two sections: 'Attribute Values' and 'Action Parameters'. In the 'Attribute Values' section, the 'Severity' field is set to '0'. In the 'Action Parameters' section, the 'Event Options' field is set to 'Copy fields from trigger event'. At the bottom of the dialog, there are 'Save' and 'Cancel' buttons.

Name	Value
Attribute Values	
Severity	0
EventName	
Message	
Resource	
SubResource	
Action Parameters	
Event Options	Copy fields from trigger event

Instead of using the default values for a correlated event, an action may be created to populate the following fields in the correlated event:

- Severity
- Event Name
- Message
- Resource
- SubResource

Add to Dynamic List

The screenshot shows a 'Configure Action' dialog box with a title bar containing a red 'N' icon and the text 'Configure Action'. The dialog has a standard Windows-style layout with a close button (X) in the top right corner. The main area is divided into several sections. At the top, there is a text field for 'Action Name'. Below it is a section labeled 'Action' which contains a dropdown menu currently set to 'Add to Dynamic List'. The central part of the dialog is a table with two columns: 'Name' and 'Value'. The table has a header row with these column titles. Below the header, there is a section titled 'Action Parameters' which is expanded, showing four rows of parameters: 'Element Values', 'Element Type' (with the value 'Persistent'), 'Dynamic List Name' (with the value 'TerminatedUsers'), and 'Attribute Names'. At the bottom of the dialog, there are two buttons: 'Save' and 'Cancel'.

Name	Value
Action Parameters	
Element Values	
Element Type	Persistent
Dynamic List Name	TerminatedUsers
Attribute Names	

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

- **Element Values:** Enter a constant value here.
- **Element Type:** Persistent or Transient
- **Dynamic List Name:** Choose 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 this event attribute will be added to the Dynamic List.

If there are entries for both Element Values and Attribute Names, both will be 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 will be updated each time the rule fires.

Remove from Dynamic List

The screenshot shows the 'Configure Action' dialog box with the title bar 'N Configure Action'. The 'Action Name' field is empty. The 'Action' dropdown menu is set to 'Remove from Dynamic List'. Below this is a table with two columns: 'Name' and 'Value'. The table has one row with the following data:

Name	Value
Dynamic List Name	TerminatedUsers

Below the table is a section labeled 'Action Parameters' with a minus sign icon. It contains three fields: 'Element Values', 'Dynamic List Name', and 'Attribute Names'. The 'Dynamic List Name' field is currently empty. At the bottom of the dialog are 'Save' and 'Cancel' buttons.

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

- **Element Values:** Enter a constant value here.
- **Dynamic List Name:** Choose 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 this event attribute will be deleted from the Dynamic List.

Execute a Command

The screenshot shows the 'Configure Action' dialog box with the title bar 'N Configure Action'. The 'Action Name' field is empty. The 'Action' dropdown menu is set to 'Execute a Command'. Below this is a table with two columns: 'Name' and 'Value'. The table has two rows with the following data:

Name	Value
Command	
Arguments	

Below the table is a section labeled 'Action Parameters' with a minus sign icon. It contains two fields: 'Command' and 'Arguments'. The 'Command' field is currently empty. At the bottom of the dialog are 'Save' and 'Cancel' buttons.

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.

References to event attributes must use the values in the metatag column in [insert reference to ch. 5, Reference Guide] enclosed in % symbols. For example, Source IP would be %sip%.

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.

Create Incident

The screenshot shows the 'Configure Action' dialog box with the 'Action' dropdown set to 'Create Incident'. Below this is a table for 'Action Parameters' with columns 'Name' and 'Value'. The parameters are: Responsible, Title, Category (DENIAL OF SERVICE), Severity (None (0)), Priority (None (0)), State (OPEN), and iTRAC Process. At the bottom are 'Save' and 'Cancel' buttons.

Name	Value
Responsible	
Title	
Category	DENIAL OF SERVICE
Severity	None (0)
Priority	None (0)
State	OPEN
iTRAC Process	

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

- Responsible
- Title
- Category
- Severity
- Priority
- State
- iTRAC Process

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

Correlation Action Administration

The Correlation Action Manager allows you to:

- **Add Action**
- **Edit Action:** If you edit an action that is associated with a deployed rule, the changes will take effect the next time the correlation rule fires.
- **Delete Action:** You cannot delete an action that is associated with a deployed rule.

To add an Action:

1. Click *Correlation* on the Menu Bar and select *Correlation Action Manager*. Alternatively, you can click on the *Correlation Action Manager* button on the Tool Bar.
2. Click *Add* button located on the top left corner of the screen. Configure Action window will display.

Name	Value
Attribute Values	
Severity	0
EventName	
Message	
Resource	
SubResource	

3. Enter an Action Name. You may select the type of action to be performed on the correlated batch.
4. Enter the attribute values for the type of action selected.
5. Click *Save*.

To edit an Action:

1. Click *Correlation* on the Menu Bar and select *Correlation Action Manager*. Alternatively, you can click on the *Correlation Action Manager* button on the Tool Bar.
2. Select *Correlated Action* and click *View/Edit* link against it.
3. The *Configure Action* window will display. Edit the options as required and click *Save*.

To delete an Action:

1. Click *Correlation* on the Menu Bar and select *Correlation Action Manager*. Alternatively, you can click on the *Correlation Action Manager* button on the Tool Bar.

2. Select *Correlated Action* and click *Delete* link against it. Confirmation message alert will display.
3. Click *Yes* to delete.

4 Incidents Tab

Topics included in this chapter:

<u>Topic</u>	<u>Page</u>
Understanding an Incident	4-1
Manage Incident Views	4-3
Adding a View	4-3
Manage Incidents	4-6
Creating Incidents	4-6
Configuring the Attachment Viewer	4-8
Switch between existing Incident Views	4-10

Understanding an Incident

In Sentinel, a set of events (events that require attention, for example, a possible attack) grouped together form an Incident. An Incident in 'open' state alerts you to investigate and close the events that resulted in the incident.

Incidents can be created:

- Manually, by a security analyst monitoring incoming data or querying past data.
- Automatically, as the result of a correlation rule being triggered. For more information, see [Chapter 3, "Correlation Tab"](#).

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.

Introduction to User Interface

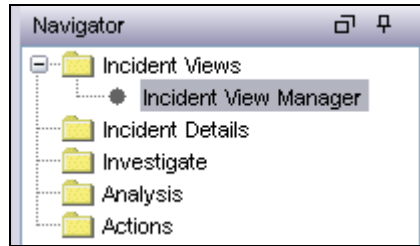
In Incidents Tab, you may see the Display Incident View, Create Incident and Attachment Viewer Configuration.

You may navigate to these functions from:

- The Incident menu in the Menu Bar



- The Navigation Tree in the Navigation Pane



- The Toolbar Buttons

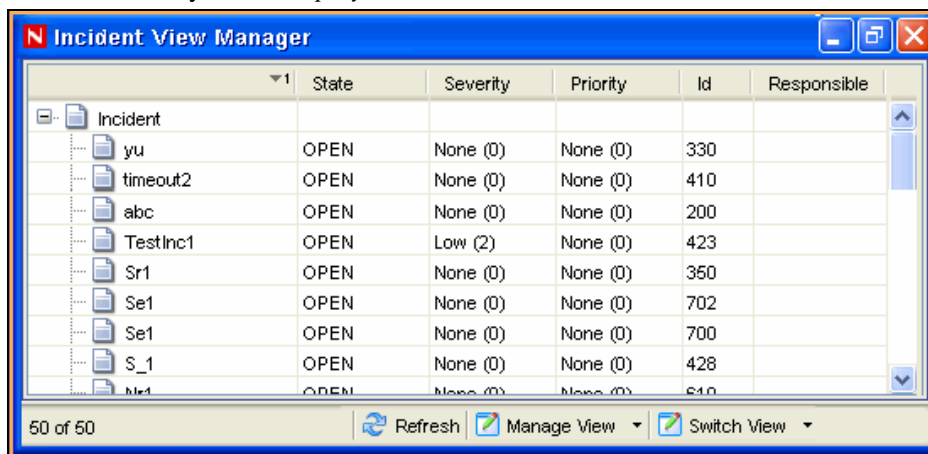


Incident View

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

To open Incident View Manager:

1. Click *Incidents* on Menu Bar and select *Display Incident Views*.
Alternatively, click *Display Incident View* button in the Tool Bar.



Incident

When you add/edit an incident, you will see the tabs listed below where you may perform the incident related activities. As you investigate and remediate an incident, additional information can be added to these tabs. This information except Events and History are optional.

- **Events:** Lists events attached to this incident. You may 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.

Manage Incident Views

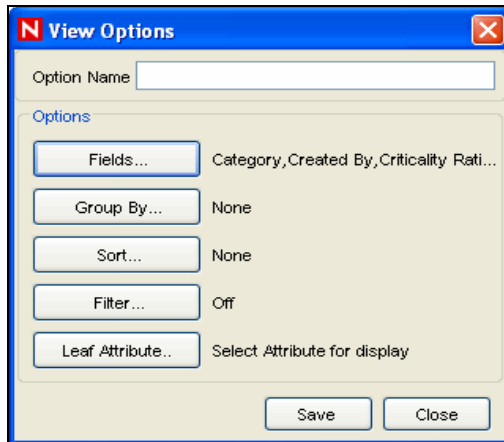
Manage View allows you to:

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

Adding a View

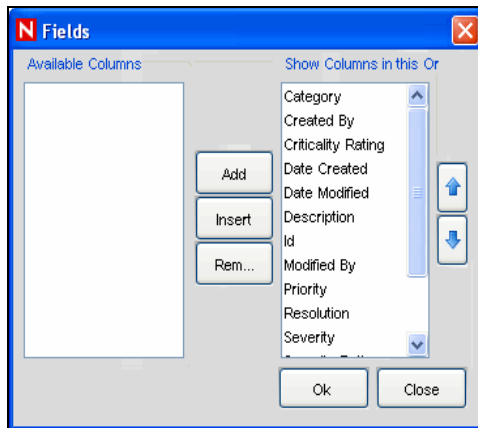
To add an Incident View:

1. Click *Incidents* on the Menu Bar and select *Display Incident View*. Alternatively, you may click *Display Incident View* button on the Tool Bar.
2. Click the down-arrow on the *Manage View* button located in bottom right corner of the screen and select *Add View* from the list. View Options window will display. You may also add a view from the Manage View option.

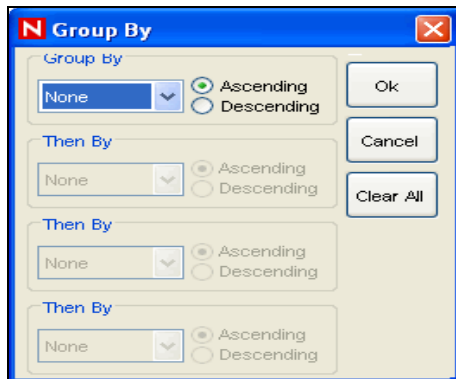


3. Enter a name for this option. Click on each button (listed below) to specify the options.

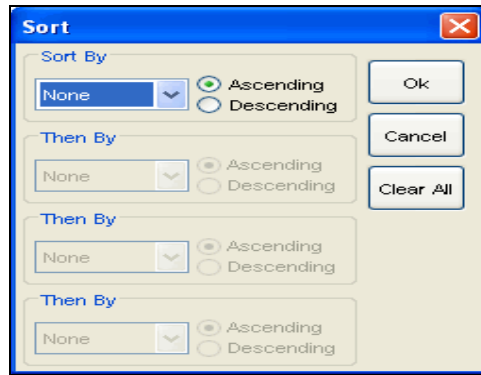
- **Fields:** The variables of the events attached to incidents are displayed as fields. By default, all the fields are arranged as columns in the Incident View. In the field options window, you may add or remove columns that display and arrange the order of the columns by moving the up and down arrows.



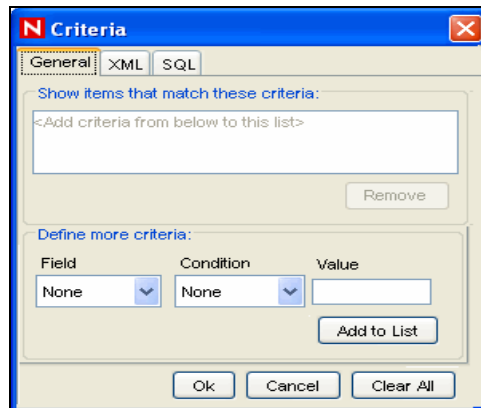
- **Group By:** You may set rules to group incidents in the display View.



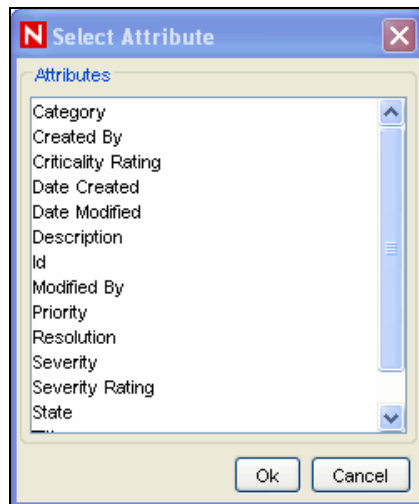
- **Sort By:** You may set rules to sort the incidents in the display view.



- **Filter:** You may set Incident filters. Only the Incidents that match your filter will display in the View.



- **Leaf Attribute:** You may select an attribute from the list which will be displayed as the first column in the Incident View.



4. Click *Save*.

Modifying a View

To edit an Incident View:

1. Click *Incidents* on the Menu Bar and select *Display Incident View*. Alternatively, you may click *Display Incident View* button on the Tool Bar.

2. 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. Alternatively, select *Manage View from the Manage View* button. The Manage View window will display. Select a view and click View/ Edit.
3. Edit the options as required and click *Save*.

Deleting a View

To delete an Incident View:

1. Click *Incidents* on the Menu Bar and select *Display Incident View*. Alternatively, you may click *Display Incident View* button on the Tool Bar.
2. Click the down-arrow on the *Manage View* button located in bottom right corner of the screen and select *Manage View* from the list. The Manage View window will display. Select a view and click Delete. Confirmation message alert will display.
3. Click *Yes* to delete.

Default View

To mark a View as default:

1. Click *Incidents* on the Menu Bar and select *Display Incident View*. Alternatively, you may click *Display Incident View* button on the Tool Bar.
2. Click the down-arrow on the Manage View button located in bottom right corner of the screen and select *Manage View* from the list. Incident View window will display.
3. Select the incident view you have to set as default, and click *Mark as Default*.

Manage Incidents

You can perform the following activities related to Incidents:

- Create an Incident
- Attach Workflows to Incidents
- Add Attachments to Incidents
- Add Notes to Incidents
- Edit an Incident
- Delete an Incident

Creating Incidents

To create an Incident:

1. Click *Incidents* on the Menu Bar and select *Create Incident*. Alternatively, you may click *Create Incident* button on the Tool Bar. New Incident window will display.

2. Enter the following information:
 - **Title:** Enter 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:** Enter the description of the Incident in the text area.
 - **Resolution:** Enter the resolution description in the text area.
3. Click *Create*. The Incident ID will be automatically generated once you click create.

NOTE: For more information on creating an incident grouping events, see [Creating Incident in Chapter 2, “Active Views Tab”](#).

Attaching Workflows to Incidents

To attach a workflow to an Incident:

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

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

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 will display.
3. Enter 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 on the note and select edit or delete.

Adding Attachments to Incidents

To add an attachment to Incident:

1. In the Incident window, click *Attachment* Tab.
2. Click *Add*. *Add Attachment to Incident* window will display.
3. Browse and select the attachment.
4. Enter the following information:
 - Name
 - Description
 - Type
 - Subtype
5. Click *OK*

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

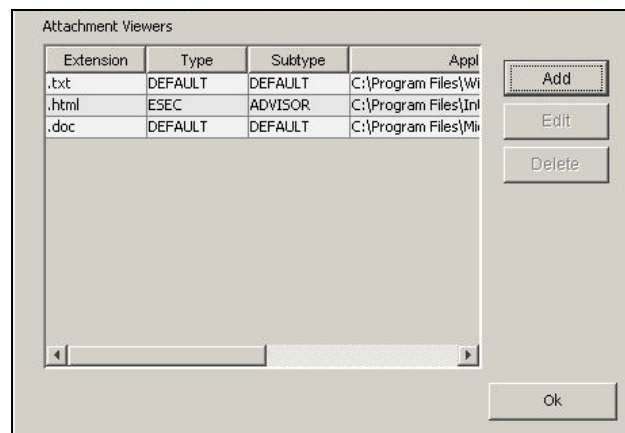
Configuring the Attachment Viewer

To configure the Attachment Viewer:

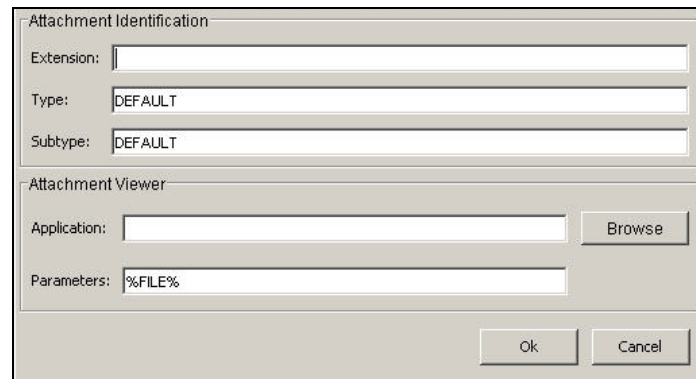
1. Click the *Incident* tab. Click *Incidents > Attachment Viewer Configuration* or click *Configure Attachment Viewers* icon.



Alternatively, you can double click the *Attachment* in the Incident window > *Attachment* Tab. The *Attachment Viewer* window will display.



2. Click *Add*. The Attachment Viewer Configuration window will display.

The image shows a dialog box titled "Attachment Viewer Configuration". It is divided into two main sections. The top section, "Attachment Identification", contains three text input fields: "Extension:" (empty), "Type:" (containing "DEFAULT"), and "Subtype:" (containing "DEFAULT"). The bottom section, "Attachment Viewer", contains two text input fields: "Application:" (empty) and "Parameters:" (containing "%FILE%"). To the right of the "Application:" field is a "Browse" button. At the bottom right of the dialog are "Ok" and "Cancel" buttons.

Enter 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*.

Modifying Incidents

To edit an Incident:

1. Click the *Incident* tab. Click *Incidents > Display Incident View*. Alternatively, you may click *Display Incident View* button on the Tool Bar. Incident View window will display with the list of incidents.
2. Right-click on the incident you want to edit and select *Modify*.
3. Incident window will display. 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.

Deleting Incidents

To delete an Incident:

1. Click the *Incident* tab. Click *Incidents > Display Incident View*. Alternatively, you may click *Display Incident View* button on the Tool Bar. Incident View window will display with the list of incidents.
2. Right-click on the incident you have to delete and select *Delete*.
3. Confirmation Message will display. Select *Yes*.

Emailing an Incident

To email an incident, the administrator must have configured Sentinel to work with a mail server either during Sentinel installation or later, in the `execution.properties` file. For more information, see [Chapter 12, “Utilities”](#).

To eMail an Incident:

1. Click the *Incidents* tab. If available, in the navigator, expand the Incidents folder or click *Incidents > Display Incident View* or click Display Incident View icon



2. Double click on an *Incident View* name.
3. Double-click on an incident.
4. Click *Email Incident* icon.



5. Enter:
 - Email Address
 - Email Subject
 - Email Message
6. Click *OK*. The e-mail message will have HTML attachments that address incident details, events, assets, vulnerabilities, advisor attacks, incident history and attachments.

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 to switch over.

5

iTRAC™ Workflows

Topics included in this chapter:

<u>Topic</u>	<u>Page</u>
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Understanding iTRAC Workflows

iTRAC Workflows are designed to provide a simple, flexible solution for automating and tracking an enterprise's incident response processes. It 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 plug-ins 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 may be defined outside the iTRAC framework:

- **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 don't have to, 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 used within workflow templates, triggered by a correlation rule, or executed by a right-click when viewing events.
- **Role** Sentinel users can be assigned to one or more Roles. Manual steps in the workflow processes may be assigned to a Role.

iTRAC 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, command steps, mail steps, and activity-based steps. Each step appears as an icon within a given workflow template.
- **Transition** A Transition defines how the workflow will move 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** A Template is a design for a workflow that controls the flow of execution of a process in iTRAC.
The template consists of a network of manual and automated Steps. Activities, and criteria for transition between them.
Workflow templates define how an incident will be responded to once a process based on that template is instantiated (see below).
A template may 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, the results of Steps, attachments, and notes.
Each workflow process is associated to one and only one incident.

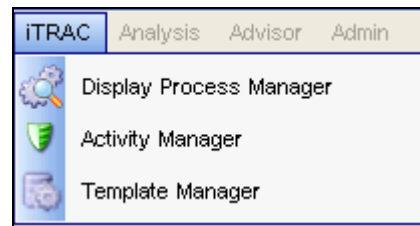
Introduction to the User Interface

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

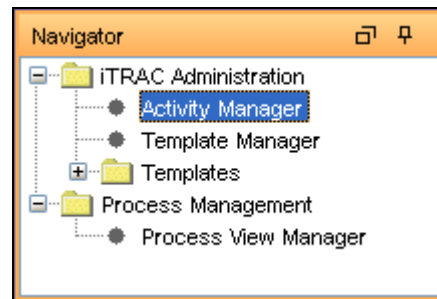
Templates), and the Process View Manager (where you manage instantiated workflow Processes).

You may navigate to these functions from:

- The iTRAC menu in the Menu Bar



- The Navigation Tree in the Navigation Pane



- The toolbar buttons

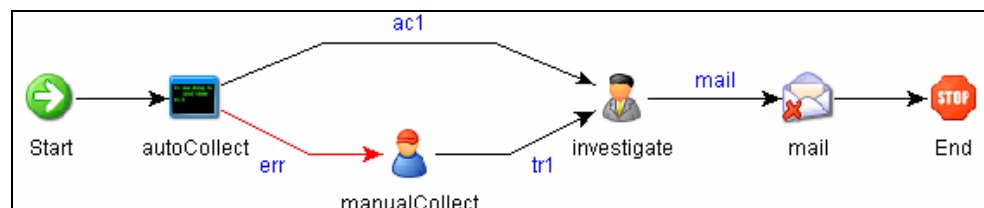


Template Manager

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 may:

- 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

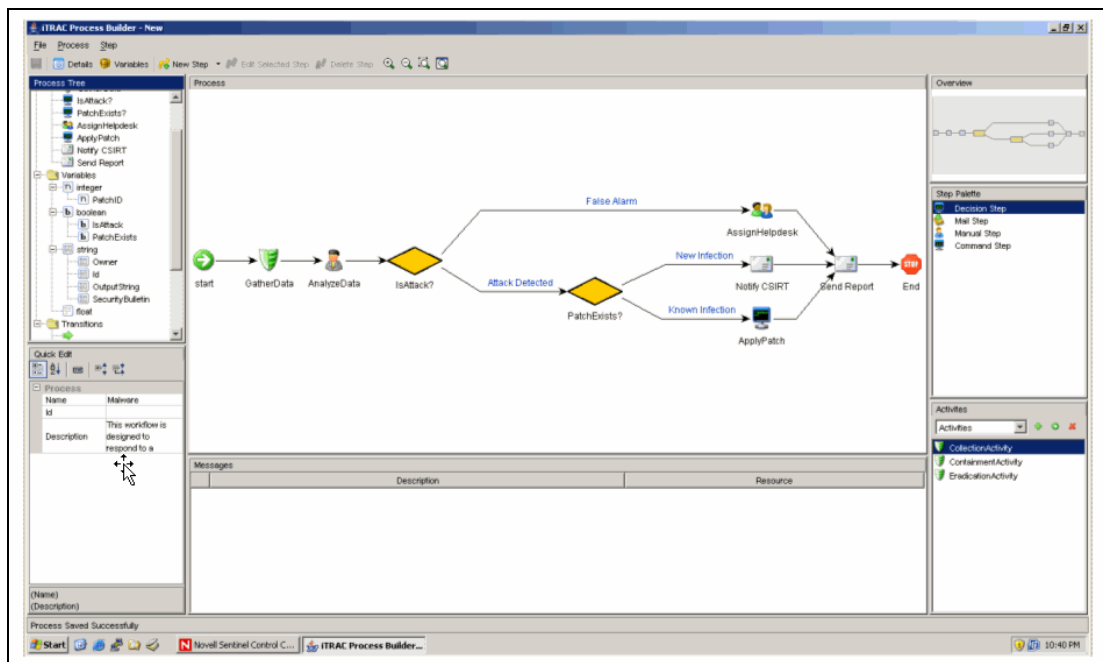


Default Templates

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

- AlertTimeoutExample
- TwoStepSimpleExample
- ConditionalTransitionExample
- CommandExample

Template Builder Interface



You will see the following panes 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 on 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 [“Creating Templates”](#).
- **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 on the Process Attribute value in the Quick Edit Pane.
- The attribute values will be 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 ["Managing Activities"](#).

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

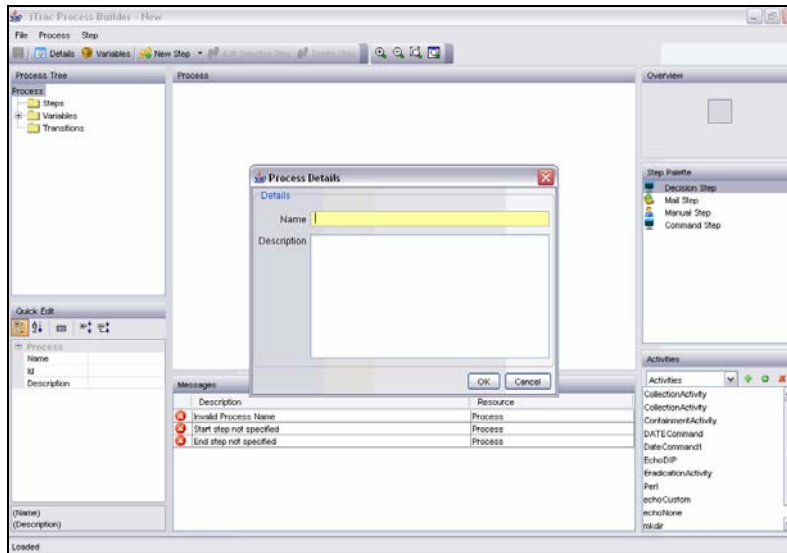
The following icons are used in the Template Builder to represent the Steps:

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.

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 will display.



4. In the Process Details window, enter 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 and select a Step type. Or right-click on Start, hover on Insert New, and select a 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 on the step after which you need to add transition and click *Add Transition*.

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

8. Right click on 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 will list any warnings or errors about incomplete steps during the construction.

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

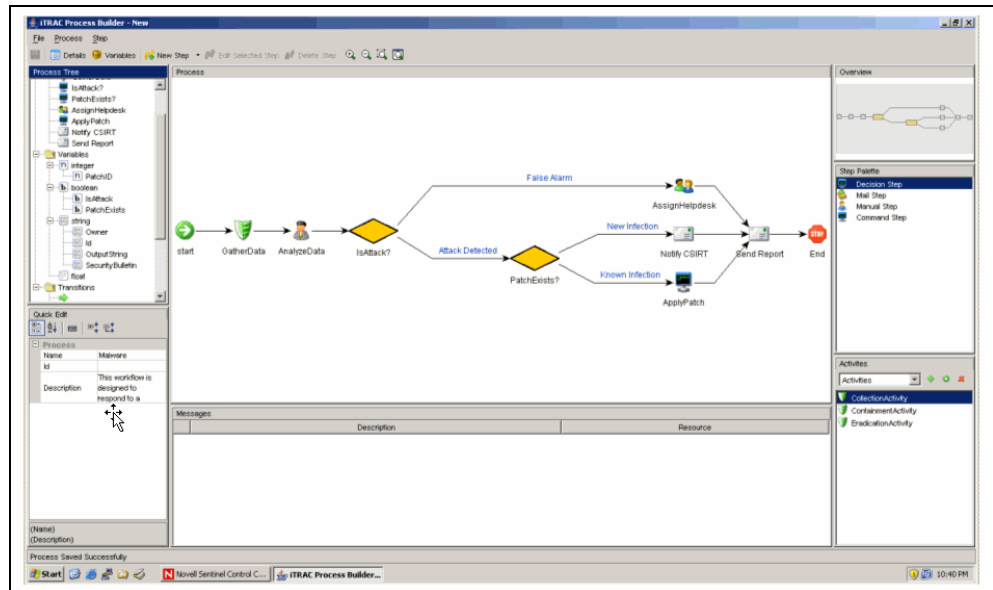
Managing Templates

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 will appear.



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 will appear.
4. Enter 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 will still complete 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*.

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

Start Step

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

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 a 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 “[Worklists](#)”.

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 may 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.

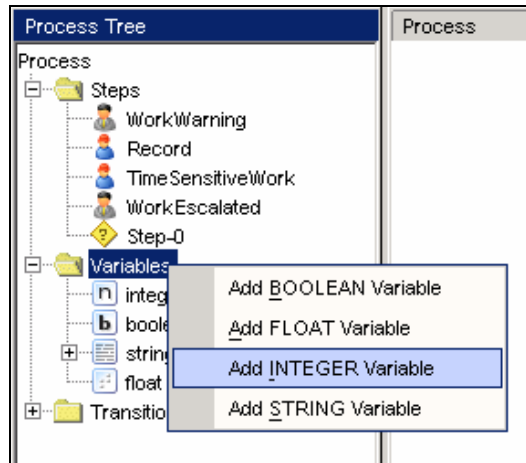
The value of the variable can be used as part of a Conditional transition to determine the path the workflow follows. It can also be used later as part of a Conditional Transition from a Decision step to determine the workflow path.

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.

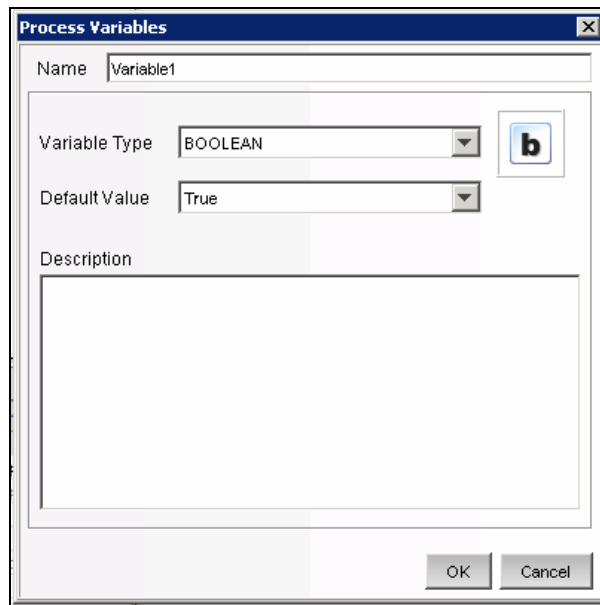
To create a variable:

1. Open an iTRAC template.
2. 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*.

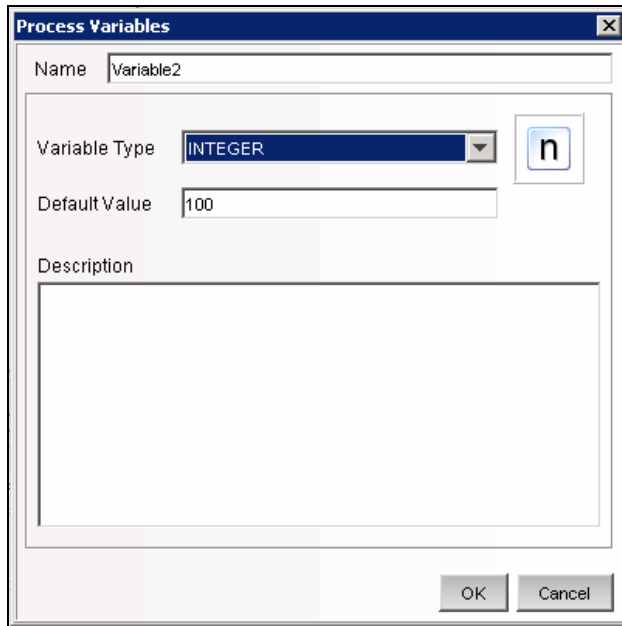


3. Give the variable a name and enter the *Default Value*, if desired.

Boolean Variable:

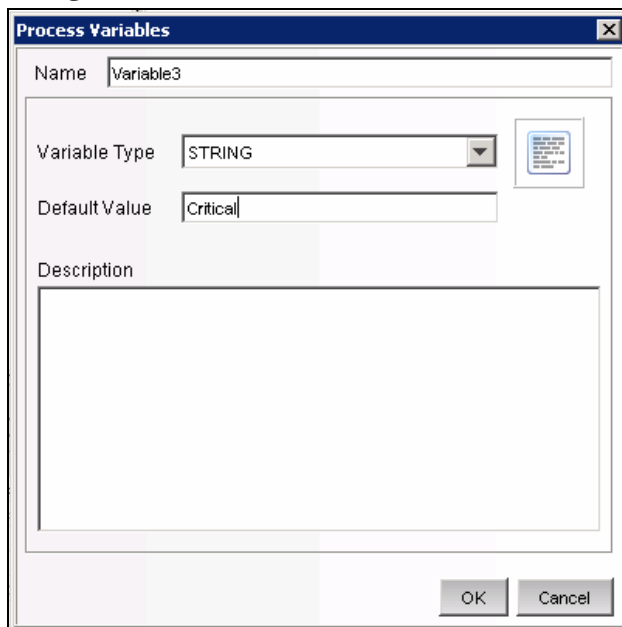


Integer Variable:



The 'Process Variables' dialog box for 'Variable2' features a title bar with a close button. It contains a 'Name' field with 'Variable2', a 'Variable Type' dropdown menu set to 'INTEGER', a 'Default Value' field with '100', and a large empty 'Description' text area. A small icon with the letter 'n' is positioned to the right of the 'Variable Type' dropdown. At the bottom right are 'OK' and 'Cancel' buttons.

String Variable:



The 'Process Variables' dialog box for 'Variable3' features a title bar with a close button. It contains a 'Name' field with 'Variable3', a 'Variable Type' dropdown menu set to 'STRING', a 'Default Value' field with 'Critical', and a large empty 'Description' text area. A small icon with a document symbol is positioned to the right of the 'Variable Type' dropdown. At the bottom right are 'OK' and 'Cancel' buttons.

Float Variable

The screenshot shows a 'Process Variables' dialog box. The 'Name' field is 'Variable4'. The 'Variable Type' is 'FLOAT'. The 'Default Value' is '65.3'. A red error message at the bottom states 'Default Value must be Float'. The 'OK' and 'Cancel' buttons are visible.

4. Click *OK*.

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

Decision Steps



This type of step selects between exit transitions depending on the values of variables defined in prior steps. See “**Manual Step**” 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.

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. It is a good practice to always include an Error transition so that errors can be immediately escalated to someone.

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 entered 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 (May be explicit or variable-driven)
- Arguments (May 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 may 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 may 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 entered 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. It is a good practice to always include an Error transition so that errors can be immediately escalated to someone.

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. Once Activity Steps have been created, the user can select from the library of these Activities and drop them into the workflow. See **“Creating an Activity”** for information on creating each type of pre-defined Activity.

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. It is a good practice to always include an Error transition so that errors can be immediately escalated to someone.

End Step

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

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 edit a Manual Step:

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

Manual Step

is assigned to a role. Variables may be associated with a manual step to get input from users

Name

General Description

Role

Associate Variables

Associate Delete Preview

Name	Type	Default
------	------	---------

☐ READ-ONLY

Name is Invalid.

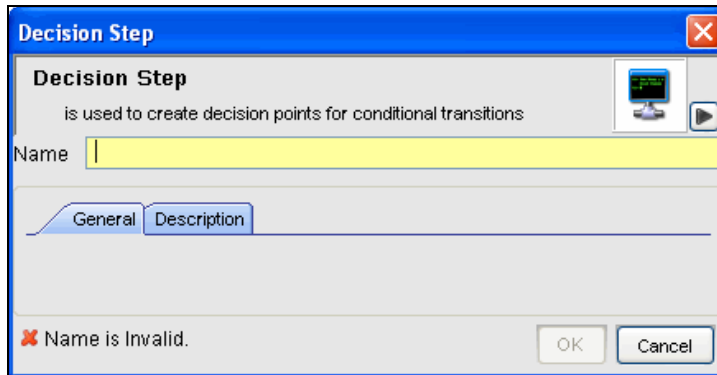
OK Cancel

2. Enter a Name for the step.
3. Attach a Role to this step by selecting a Role from the drop-down list. (Roles are defined on the Admin tab documentation)

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 on *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 on a Decision Step and select *Edit Step*.



Decision Step

is used to create decision points for conditional transitions

Name

General Description

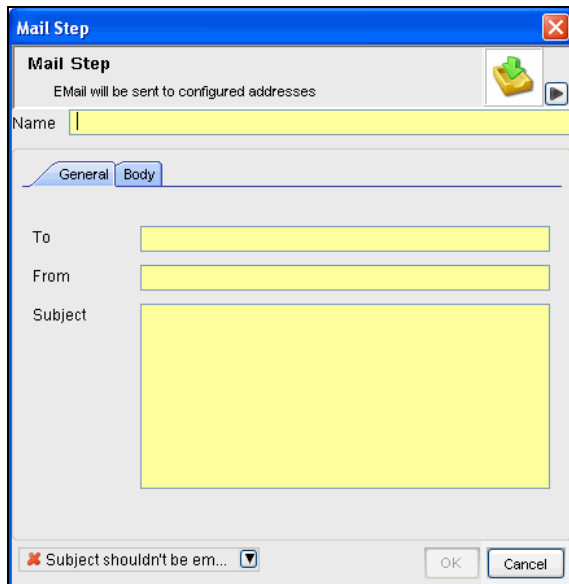
✖ Name is Invalid.

OK Cancel

2. Enter Name.
3. Click on *Description* tab to provide description for this step.
4. Click *OK*

To edit a Mail Step:

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



Mail Step

Email will be sent to configured addresses

Name

General Body

To

From

Subject

✖ Subject shouldn't be em...

OK Cancel

2. Enter Name for the step.
3. Enter *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 on 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

☐ Use Variables

Command

☐ Use Variables

Arguments

Output Variable

Output variable not set

OK Cancel

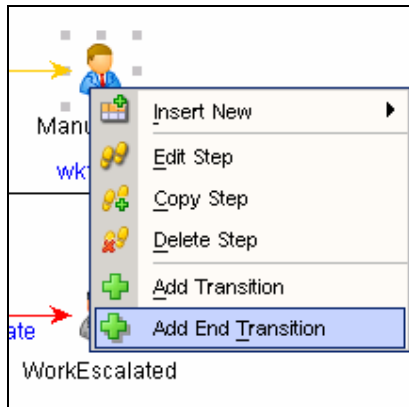
2. Enter a Name for this step.
3. Specify the path and name of the command or script to execute (relative to the \$ESEC_HOME/config/exec or %ESEC_HOME%\config\exec directory)
4. If you wish to run a command or script referenced in a variable that gets populated during the workflow process, check the *Use Variables* box.
5. Specify any command-line arguments to pass to the command or script. If you wish 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 on *Description* tab to enter description for this step.
8. Click *OK*.

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 on a Step with no transition and select *Add End Transition*.



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 will display.
4. Select an existing step, right-click, and select *Copy Step*.
5. The step window will open in edit mode with all the attributes of the selected step. Enter 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 will display.
4. Select an existing step, right-click, and select *Edit Step*.
5. Edit the step attributes. Click *OK*.

Deleting Steps

To delete 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 will display.
4. Select an existing step, right-click, and select *Delete Step*.
5. On the alert message window, select *Yes* to delete.

Transitions

There are several types of transitions:

- Unconditional
- Conditional
- Timeout
- Alert
- Else
- Error

A Transition can have the following attributes:

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

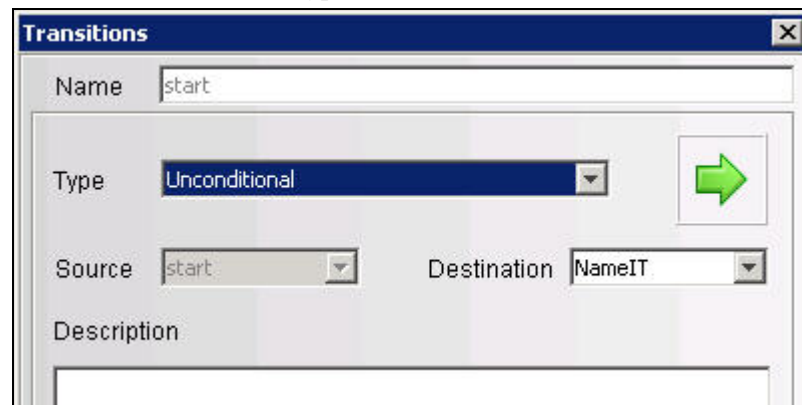
Unconditional Transitions

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

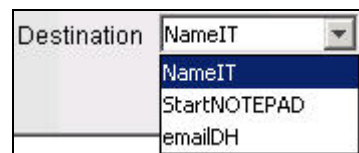
This path is taken when the current step is completed (unless a timeout transition is configured and the timeout period elapses).

To add an Unconditional Transition:

1. Open the Process Builder.
2. Select an existing step, right-click and select *Add Transition*.
3. Enter 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. Enter a description for this transition and click *OK*.

Conditional Transitions

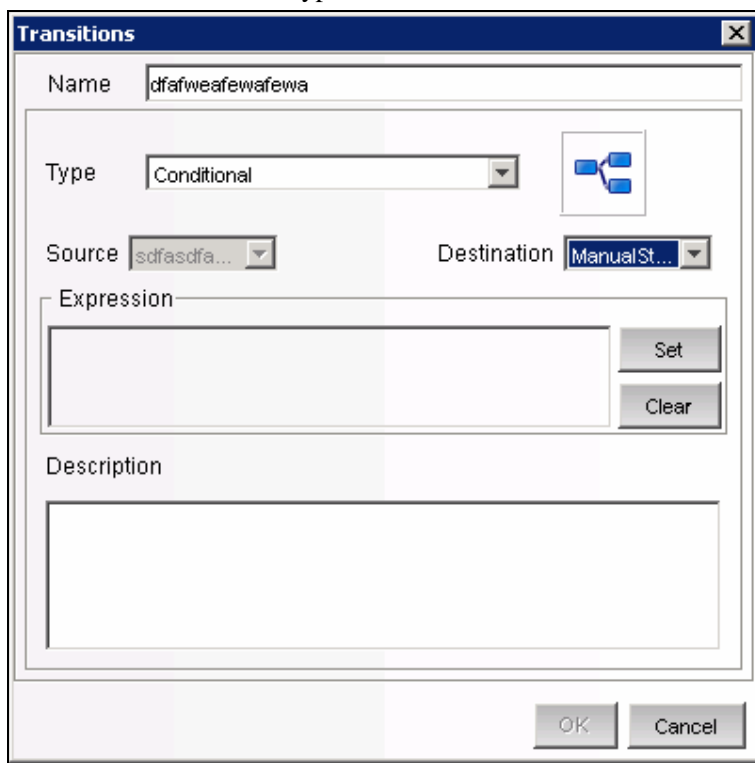
Select an exit path based on an expression using iTRAC variables set in a Manual or Command step.

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

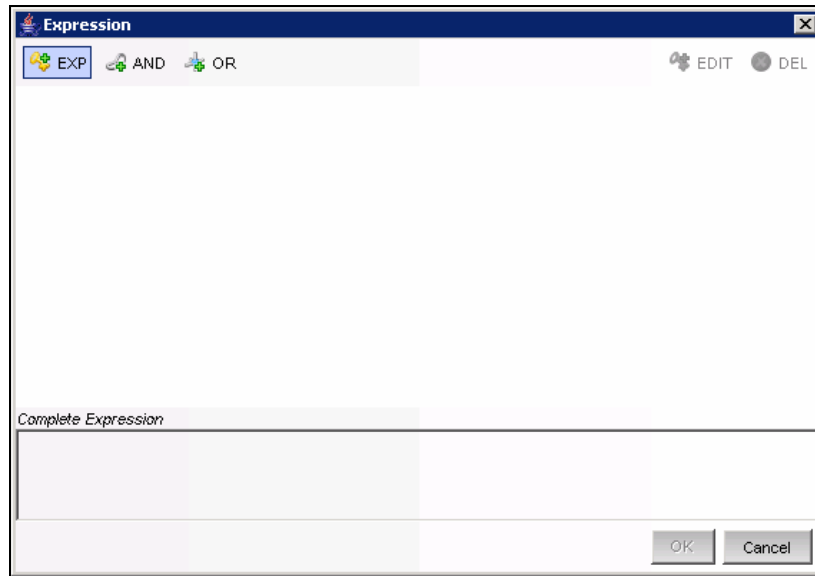
When creating a Conditional Transition, the conditional expressions can be based on comparing a variable that is populated during the workflow process to a specific value or to another variable populated during the workflow process. Multiple conditional expressions can be combined or nested using the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

To add a Conditional Transition:

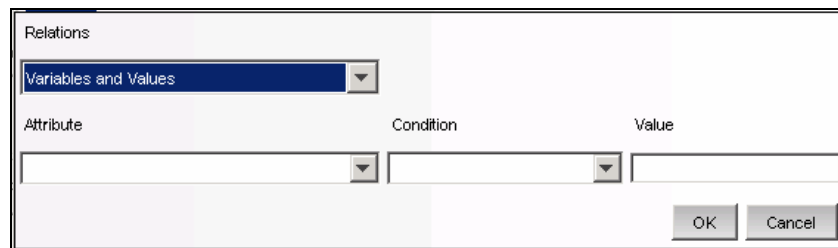
1. Open the Process Builder.
2. Select an existing Decision step, right-click and select *Add Transition*.
3. Enter a name for the transition.
4. Select the Transition type *Conditional* from the list.



5. Specify the destination Step.
6. Click *Set* to add an expression. The empty Expression window will display.

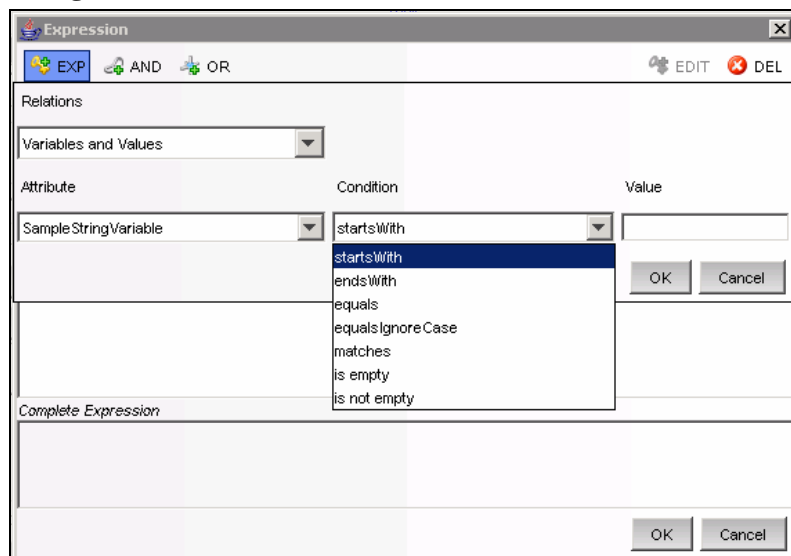


7. Click *EXP* to add the first expression. The evaluation expression is an expression that will evaluate to TRUE or FALSE during the workflow process. Select the appropriate dropdown under Relations to compare a variable to a constant value (*Variables and Values*) or to another variable (*Variables 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 will vary depending on the type of Attribute variable chosen.

String Variable Conditions:



Integer and Float Variable Conditions:

The screenshot shows the 'Expression' dialog box with the 'Relations' section selected. The 'Variables and Values' dropdown is open, showing 'SampleIntegerVariable'. The 'Condition' dropdown is open, showing a list of conditions: 'is exactly', 'is not', 'is <', 'is <=', 'is >', and 'is >='. The 'Value' field is empty. The 'Complete Expression' field is also empty. The 'OK' and 'Cancel' buttons are visible at the bottom right.

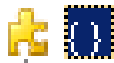
Boolean Variable Conditions:

The screenshot shows the 'Expression' dialog box with the 'Relations' section selected. The 'Variables and Values' dropdown is open, showing 'SampleBooleanVariable'. The 'Condition' dropdown is open, showing a list of conditions: 'equals' and 'not equals'. The 'Value' field is set to 'True'. The 'Complete Expression' field is also empty. The 'OK' and 'Cancel' buttons are visible at the bottom right.

10. Set the Value.

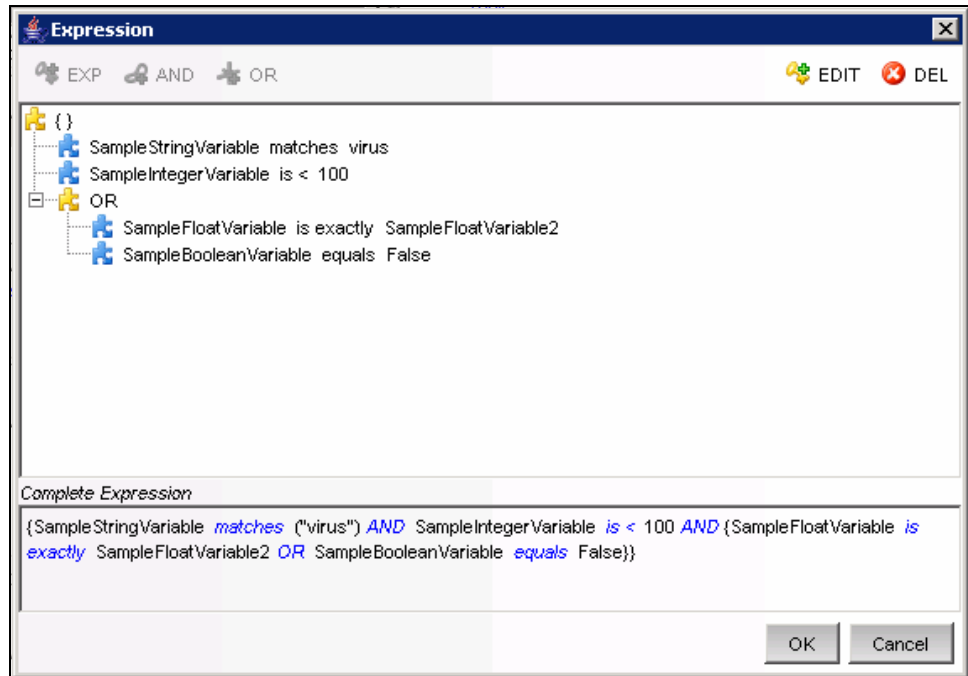
11. Click *OK*.

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 will be 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 entered will display in Transition window under Expression section.

17. Enter a description for your transition and click *OK*.

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. Enter a description for this step and click *OK*.

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 enter the Timeout details. Timeout details window will display.
6. Specify the timeout value in minutes, hours, or days. Click OK.
7. Select Base Time.
8. Enter a description for your transition and click OK.

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 will branch into two active paths. The original step remains active for user intervention. The alert path will also be initiated. For example, the alert path may escalate the workflow process to the attention of a supervisor, while 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 may 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 enter the Alert details. Alert details window will display.
6. Specify the Alert time value, in minutes, hours, or days. Click *OK*.
7. Enter a description for your transition and click *OK*.

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 will only be 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. Enter a description for this step and click *OK*.

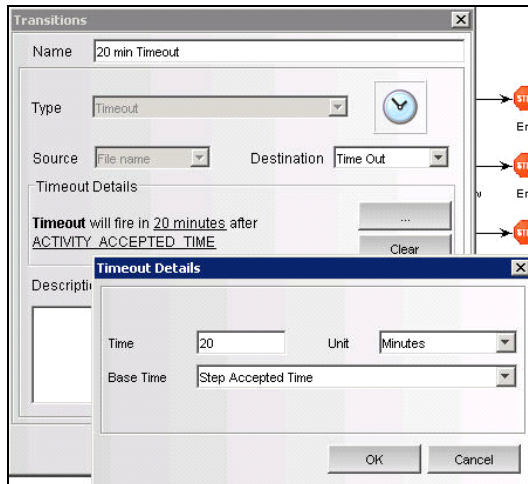
Managing Transitions

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 will display.
4. Double-click an existing transition line. The Transitions window will open.
5. Edit the transition as needed.
6. If you are editing an expression from a decision step, click the ‘...’ button and double-click on the expression.



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

Deleting Transitions

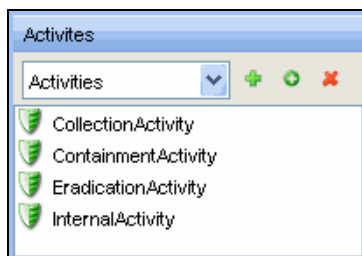
To Delete a Transition:

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

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 / imported as xml files. These files can be exported/imported from one system to another.



Sentinel provides three types of actions that can be used to build Activities:

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

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 may be used as input to the command:

- DIP [Destination IP]
- DIP:Port
- RT1 (DeviceAttackName)
- SIP [Source IP]
- SIP:Port
- 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.

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 Source IP address (SIP) or the Destination 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.

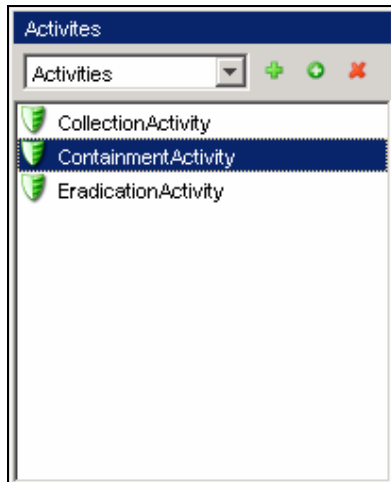
Incident Composite Activity

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

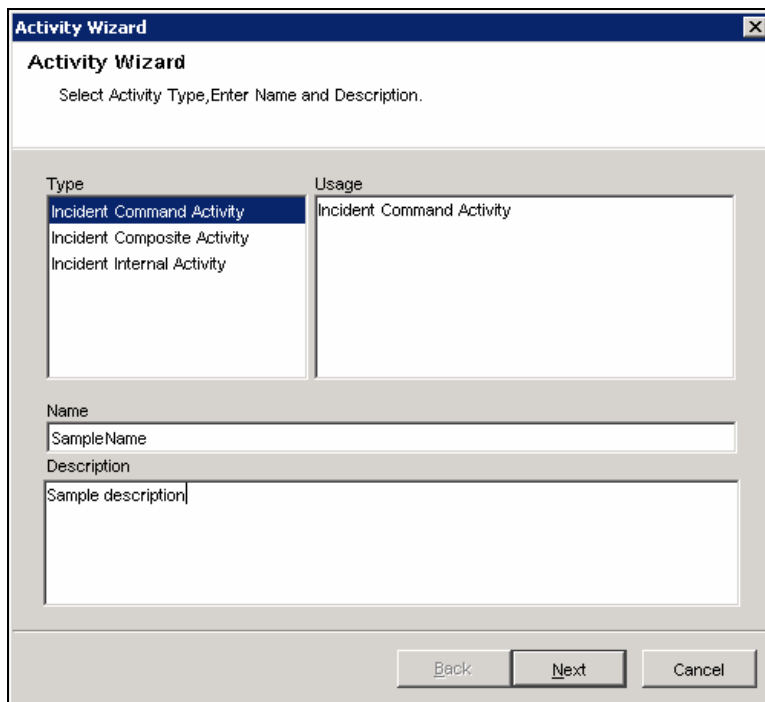
Creating Activities

To create an Activity:

1. Click the *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 will display.
4. Select an Activity type: Command, Internal, or Composite.
5. Enter 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, enter the Command.
 - Enter the Arguments for this command. You may select None, Incident Output (Values from the Drop-down list), or enter custom values.

Activity Wizard

Command Arguments Wizard

Provide command name and select required command argument type.

Command:

Arguments:

☒ None

☐ Incident Output

☐ Custom

Description

Back Next Cancel

- 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 enter 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

Back Next Cancel

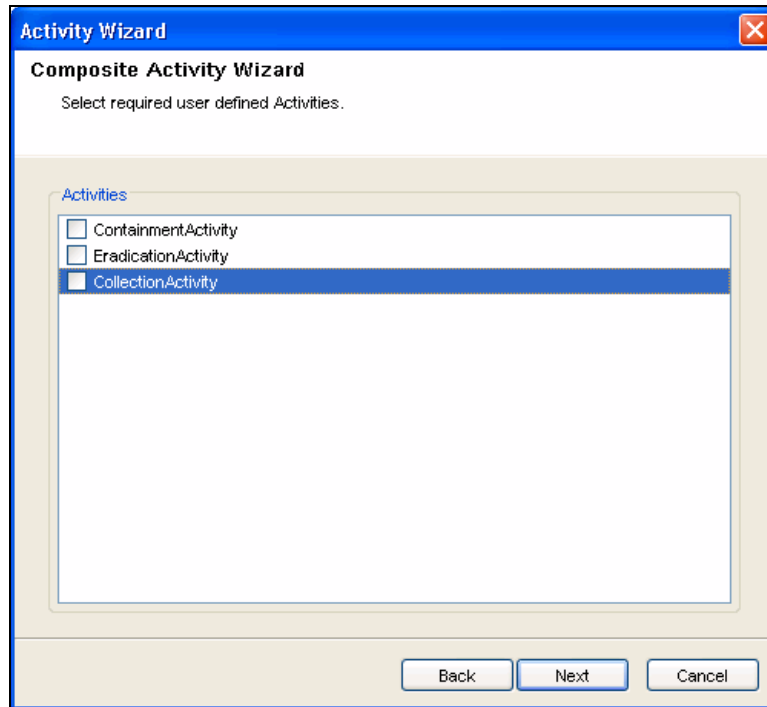
- Select Attach to Incident, if required.
- Click *Next*.

- View and confirm the details you chose in the Summary page and click Finish.
- **Incident Internal Activity**
 - In the Command Arguments Wizard, enter the Command.
 - Enter the Arguments for this command. You may select None, Incident Output (Values from the Drop-down list), or enter custom values.

The screenshot shows a Windows-style dialog box titled "Activity Wizard" with a subtitle "Internal Activity Mail and Attachment Wizard". Below the subtitle is the instruction "Select required mails and attachments." The main area of the dialog is divided into two sections. The top section, labeled "Mail and Attach", contains a table with two columns: "Mail" and "Attach". Under "Mail", there are two unchecked checkboxes. Under "Attach", there are two rows: the first row has an unchecked checkbox followed by the text "Vulnerability" and a dropdown menu currently showing "SIP"; the second row has an unchecked checkbox followed by the text "Advisor Data". The bottom section, labeled "Description", contains a large empty text box. At the bottom right of the dialog are three buttons: "Back", "Next", and "Cancel".

Click *Next*.

- Select your options (Mail and attach).
- If you select Mail, you will be prompted to enter *To*, *From* email address and *Subject*. Enter 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.

Managing Activities

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

Modifying Activities

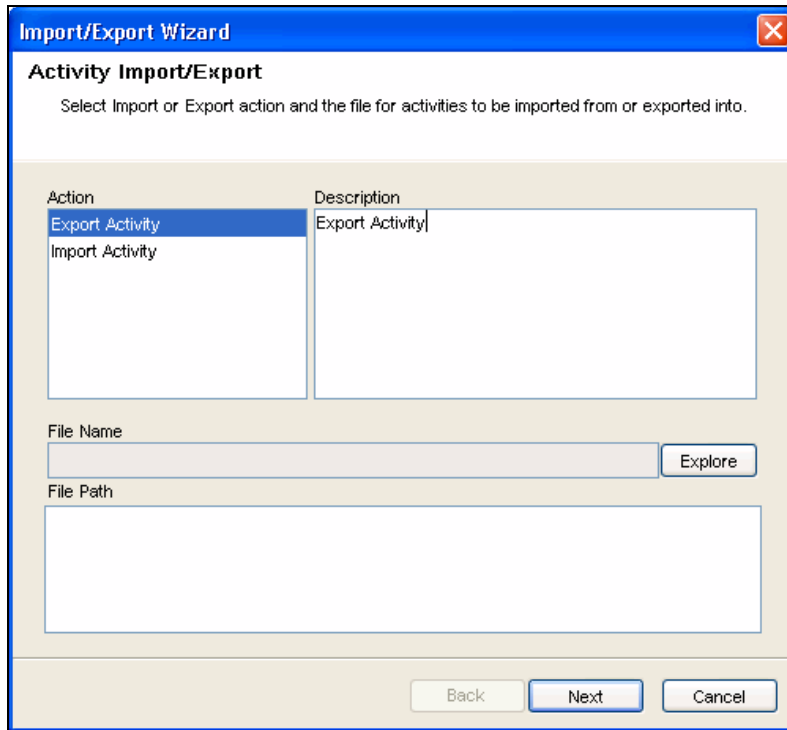
To modify an Activity:

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 will display.
4. Edit information in General, Arguments and Attachment tabs.
5. Click *OK*.

Exporting Activities

To export an Activity:


1. Click the *iTRAC* tab.
2. In the Navigator, click *iTRAC Administration > Activity Manager*.
3. Click *Import/Export Activity* icon. Import/Export wizard window will display.



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 the *iTRAC tab*.
2. In the Navigator, click *iTRAC Administration > Activity Manager*.
3. Click *Import/Export Activity icon* . Import/Export wizard window will display.
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 will be imported.
7. Click *Next* and click *Finish*.

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 may be associated to an iTRAC process instance.

Instantiating a Process

An iTRAC process may 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 association a process to an incident, see [Chapter 4, “Incidents Tab”](#).

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 will run and attach the results to the associated incident.

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 will be 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 [Chapter 6, “Work Item”](#).

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

Display Status

The Display Status function is to monitor the progress of a process. As the process instance progresses from one activity the user may 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 while executing the process.

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

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

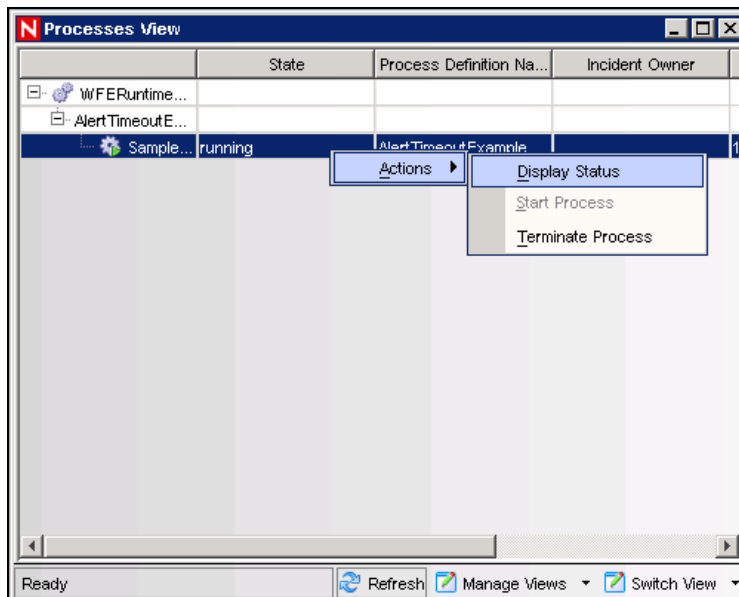
Displaying Status of a Process

To display Status:

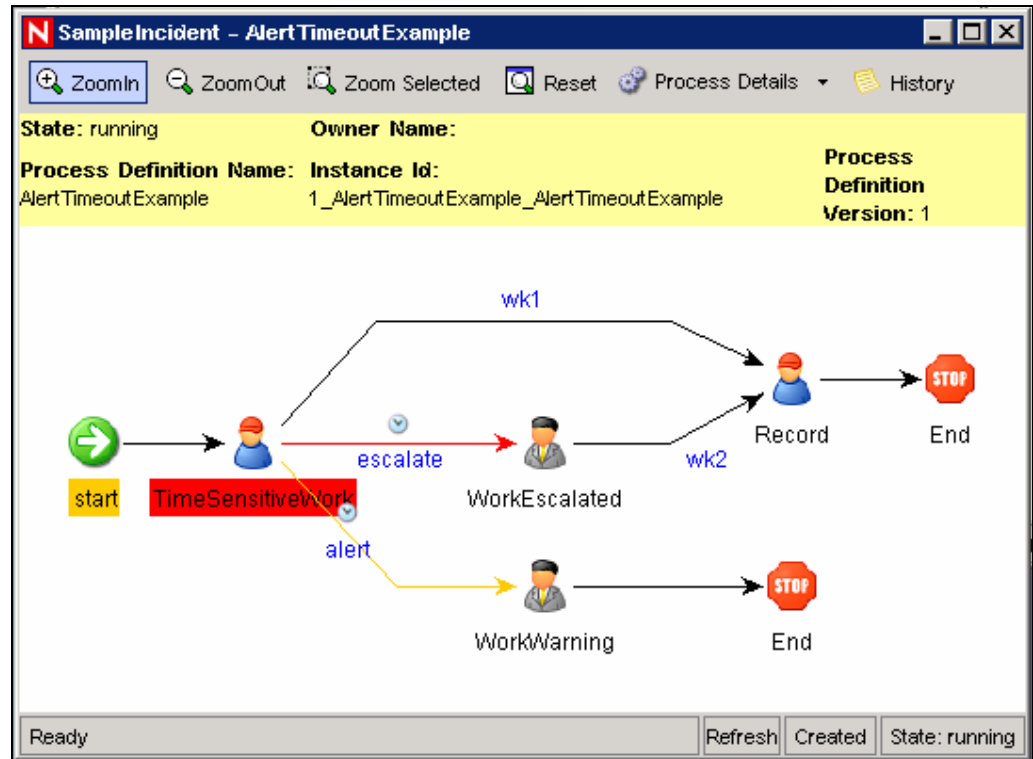
1. Click the *iTRAC* tab.
2. Click the *Display Process Manager* icon.



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 on a process and select *Actions > Display Status*.



5. The current step is highlighted in red.



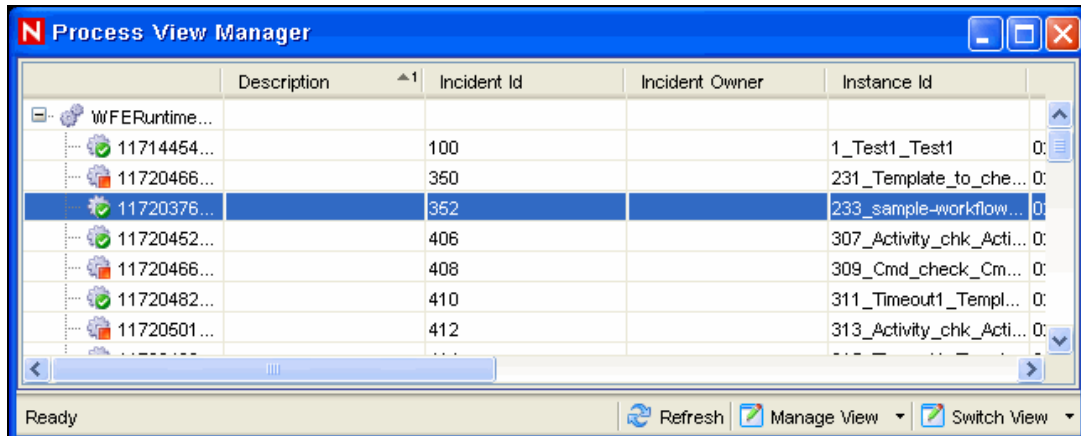
6. Click the “X” in the upper right corner when done.

Changing Views in Process Manager

To Change the View in the Process View Manager:

1. Click the iTRAC tab.
2. Click the *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 may also set your:
 - Fields.
 - Group by.
 - Sort.
 - Filter.
 - Tree Display.
5. Click Apply and Save

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



Starting or Terminating a Process

To Start or Terminate a Process:

1. Click the *iTRAC* tab.
2. Click the *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*.

6

Work Items

Topics included in this chapter:

<u>Topic</u>	<u>Page</u>
Understanding Work Items	6-1
Processing a Work Item	6-3
Work Item Management - Administration	6-5

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"](#). You may access the work items from any tab in the Sentinel Control Center.

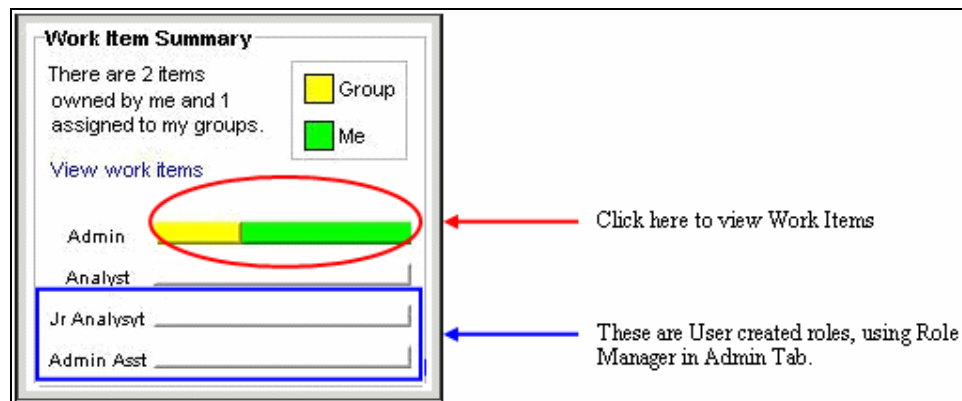
NOTE: To have access to a work item, you should have it assigned to you or acquire the work item.

Work Item Summary

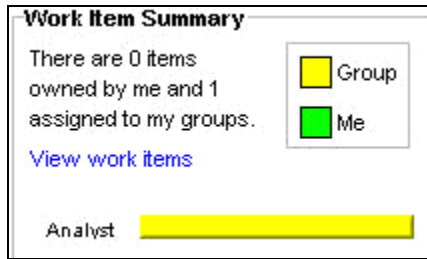
The Work Item Summary lists the work items allocated to a user as an individual and as a member of a group; it can be referred as an incident workflow to-do list for a user who is a part of the Incident response process. In the Work Item Summary, you may access the work items and:

- 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.

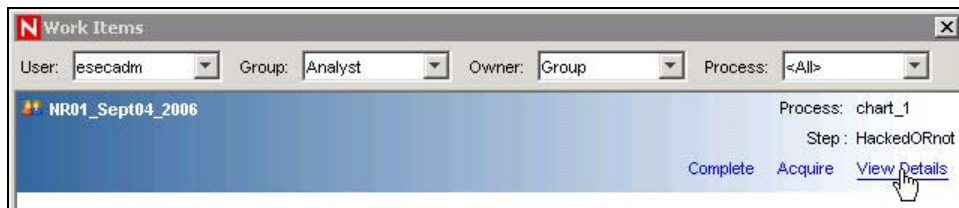


The following is an example of a user who is a member of the Analyst group who has a process assigned to his role (group).

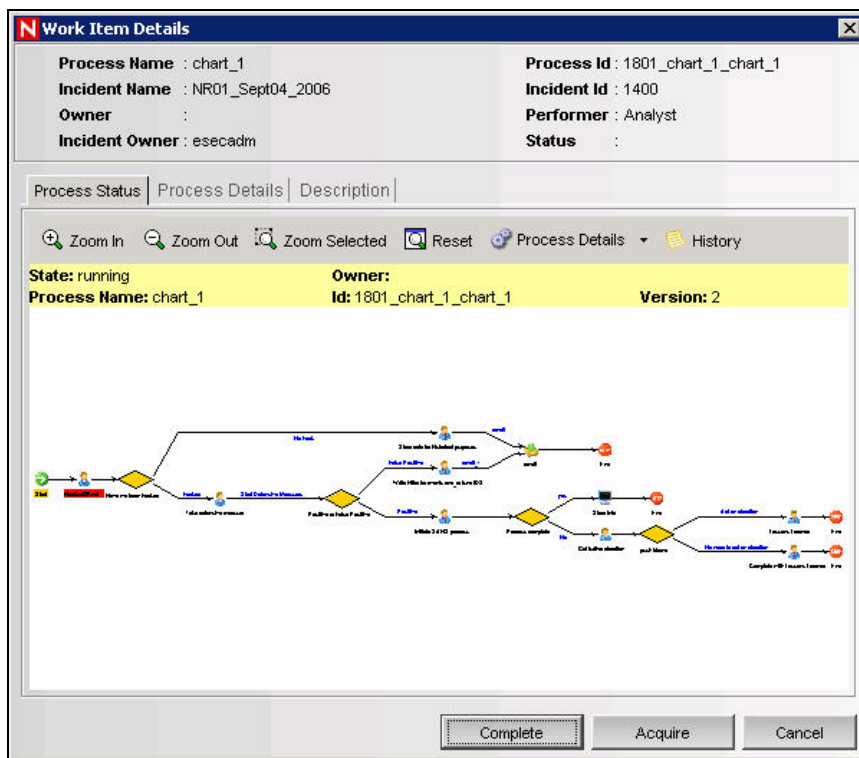


To access a Work Item:

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



2. Select work item and click *View Details*. Work Item Details window will display.



3. The Process Status tab in this window will display the Work flow. Click *Process Details* tab to view the process details.

Work Item Details

Process Name : chart_1
Incident Name : NR01_Sept04_2006
Owner :
Incident Owner : esecadm

Process Id : 1801_chart_1_chart_1
Incident Id : 1400
Performer : Analyst
Status :

Process Status | Process Details | Description

YesHacked: true (dropdown menu open showing true, true, false)

Comments: Add... Attachments: Add...

(Comments and attachments will be added to associated incident)

Complete Acquire Cancel

You can also add comment and attachments to the process. Attachments will appear in the Incidents tab.

The Description Tab displays the Step Description and Process Description you entered while creating workflow in iTRAC. For more information on iTRAC processes, see [Chapter 5, “iTRAC Workflows”](#).

Work Item Details

Process Name : TwoStepSimpleExample
Incident Name : testincident
Owner :
Incident Owner : esecadm

Process Id : 1_TwoStepSimpleExample_TwoStepSimpleEx
Incident Id : 100
Performer : Admin
Status : running

Process Status | Process Details | Description

Step Description

Process Description

This example consists of a simple workflow consisting of two manual steps with unconditional transitions. At runtime this example may be used to demonstrate the sticky owner behavior.

Complete Acquire Cancel

Processing a Work Item

A Work Item can be run under any tab of the Sentinel Control Center.

- A Work Item can be processed while still in a Group and not acquired by a user. However, once a step is completed and the next step is of the same group, the step will be acquired by the user.
- After acquiring a Work Item steps in succession that belong to a Group and has been acquired by a user, the Work Item will stay with the user.
- If a single of succession of steps are with a user followed by a step of another group and returns back to the original role, the step will not revert to the user. It will be assigned to the group.

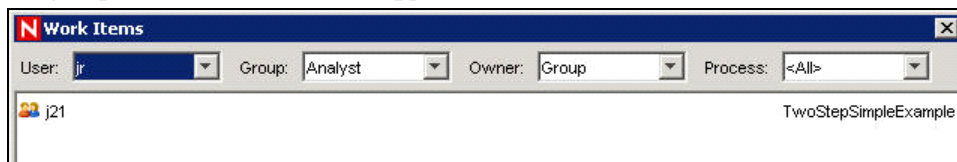
The two stages of processing a work item are

- Accepting a work item
- Completing a work item

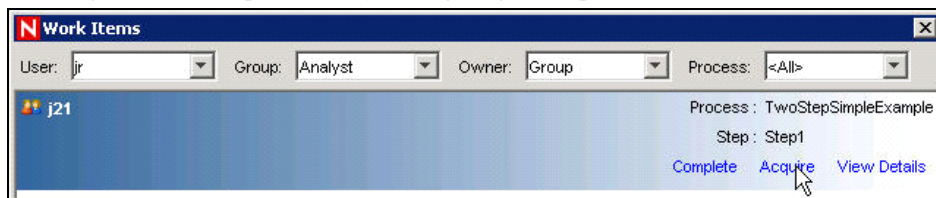
Accepting a Work Item

To accept Work items:

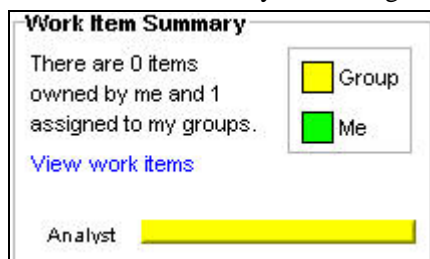
1. In the Work Item Summary, click on the yellow or green bar. A work item list for the group or the current user will appear.



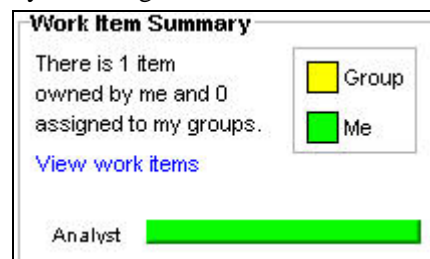
2. To assign an iTRAC process to you, high-light the process and click *Acquire*.



The Work List Summary will change from yellow to green.



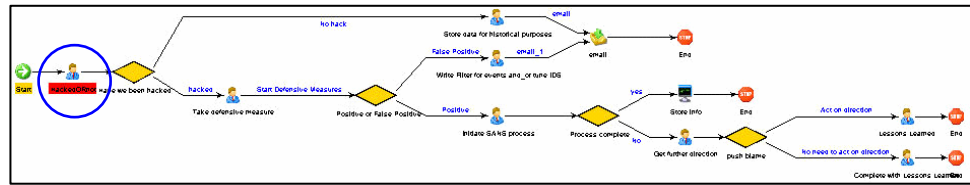
Work item assigned to a group (role)



Work item assigned to the user under the Analyst role.

NOTE: When acquiring (accepting) a process, all other users in the same role you are in will no longer see the process. You can place the process back to the group by clicking *Release*.

3. Click *View Details*.
4. The current step within a Work Item will be high-lighted in red.



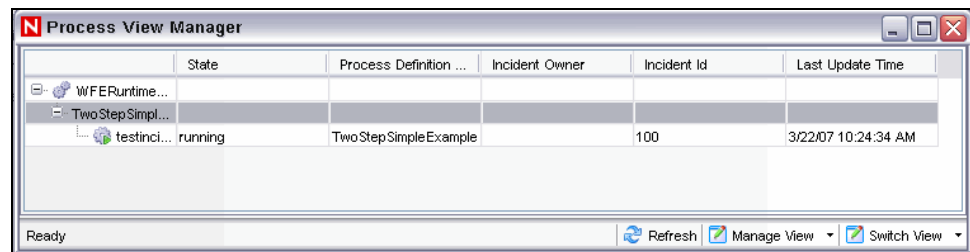
5. To take action on the step, click the *Process Details* tab.
In the case of a manual step and depending on the type of variable (Integer, String, Boolean and Float) assigned to that step, click the down arrow and select a decision. If needed, you can add comments or add an attachment.
In all other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

Completing the Work Item

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 activity based on some criteria. The work item is removed from the worklist. A work item has to be acquired before it can be completed.

To complete Work Items:

1. Click *View work items* link in *Work Item Summary* pane. Work items window will display.
2. Click *Complete*.

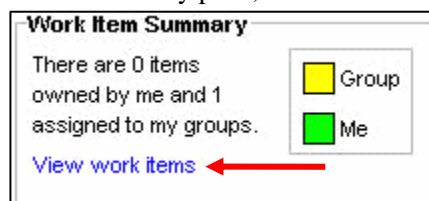


Work Item Management - Administration

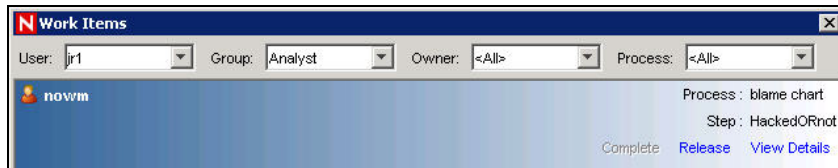
The Administration function allows an administrative user to release a Work Item from a specific user back to everyone in a role. This is beneficial in the event that a Work Item is in already in process but the assigned user cannot complete the work.

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

1. Login into Sentinel as a user with *iTRAC – Work Item Management* 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* will change to *Acquire* (grayed out).

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

7

Analysis Tab

Topics included in this chapter:

<u>Topic</u>	<u>Page</u>
Understanding Analysis	7-1
Top Ten Reports	7-2
Running a Report from Crystal Reports	7-4
Running an Event Query Report	7-4
Creating an Offline Query	7-5

Understanding Analysis

The Analysis tab allows for 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 bar.

Analysis also provides Offline Query and Crystal reports 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 Report you can view predefined reports. You may also customize reports to meet your requirements.

NOTE: Sentinel is integrated with Crystal Reports® to generate and display reports. The administrator must configure the location of the Crystal Enterprise Server that publishes reports in the Reporting 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 need to have Crystal Reports Enterprise Edition installed and have your Sentinel Control Center configured to access that server. For more information, see [Crystal Reports for Windows or Crystal Reports for Linux in Sentinel 6.0 Installation Guide](#).

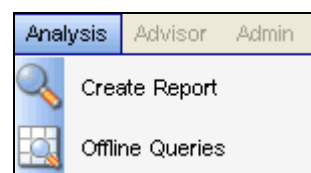
NOTE: You must have the proper permission to use Analysis tab. If this permission is not assigned, Analysis tab is not displayed.

Introduction to the User Interface

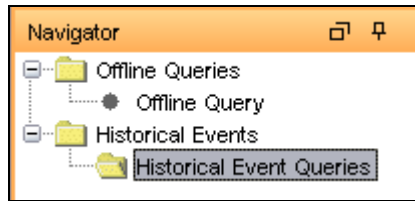
In Analysis, you may see the Create Reports and Offline Queries options.

You may navigate to these functions from:

- The Analysis menu in the Menu Bar



- The Navigation Tree in the Navigation Pane



- The Toolbar Buttons



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 Destination Source Host Names
- Top 10 Destination Source IP Addresses
- Top 10 Destination Source to Destination IP Pairs
- Top 10 Destination 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
- 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

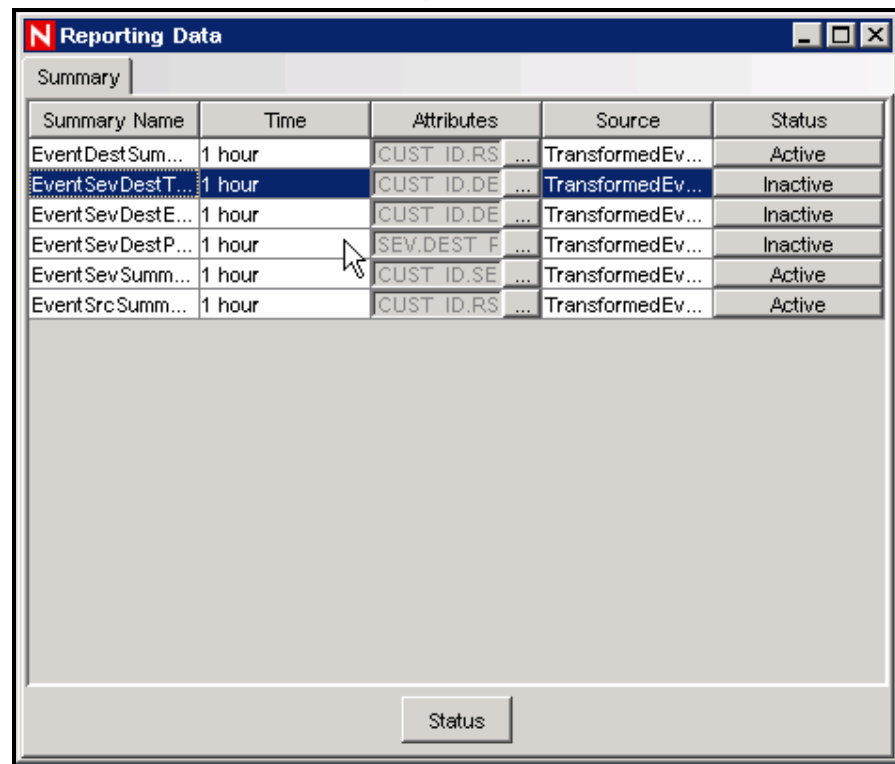
If Top 10 reports are not needed, you can disable these summaries, or you can enable additional summaries in order to use them for reporting. If the summary service is not in use, you may disable it.

To enable/disable Aggregation:

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

To enable/disable summaries:

1. In Sentinel Control Center, go to *Admin > Reporting Data*.
2. Highlight the Summary to enable/disable and click on 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:

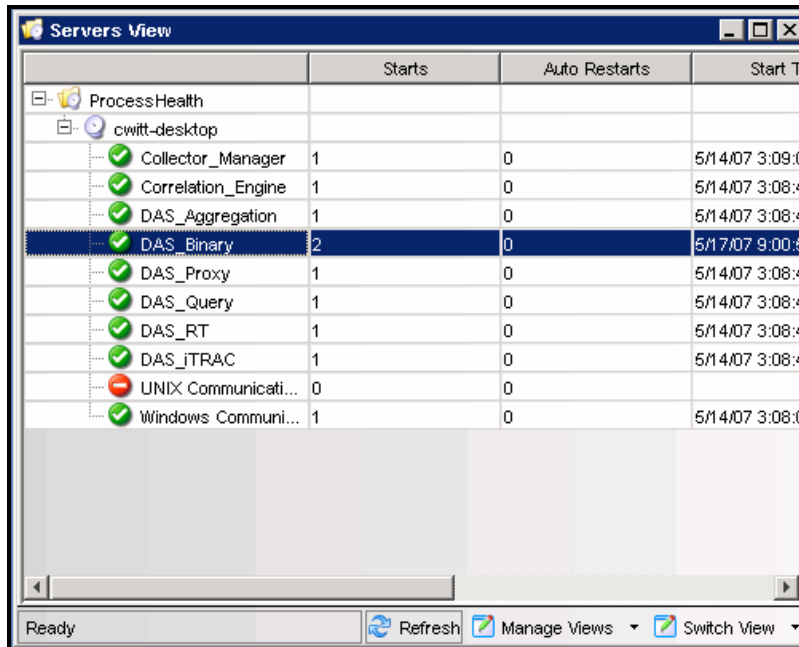
```
%ESEC_HOME%\config\das_binary.xml
```

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 choose *Restart*.

Running a Report from Crystal Reports

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 [Reporting Data section in Chapter 10, “Administration”](#).

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



4. Complete the information prompts and click *OK*. The report will display.

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 will open.

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.

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.

Creating an Offline Query

To create an Offline Query:

1. Click *Analysis* on the Menu Bar. The *Offline Query* window will display. 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 will display.

3. Enter 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”](#).
4. Select the *Start Date* and *End Date* for which you want to generate an offline query.
5. Enter the description in the Description Tab.

6. Click *OK*. The Offline Query gets listed in the *Offline Query* window.

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 will display. Alternatively, you can click *Offline Query* button on the Tool Bar.
2. In the *Offline Query* window, select an offline query. You will have the following options 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 will display. Click *Yes* to delete.
 - **Details:** Click *Details* to view the details of the Offline Query as entered while adding the Query.

8

Advisor Usage and Maintenance

Topics included in this chapter:

<u>Topic</u>	<u>Page</u>
Understanding Advisor	8-1
Standalone Installation – Advisor Manual	8-3
Updating	
Direct Internet Download – Advisor Manual	8-3
Updating	
Running Advisor Reports	8-2
Changing the Scheduled Data Update Time	8-5

Understanding Advisor

Advisor is an optional subscription service that provides device-level correlation between real-time events from intrusion detection and prevention systems and enterprise vulnerability scan results. By providing normalized attack information, Advisor acts as an early warning service to detect attacks against vulnerable systems. It also provides associated remediation information.

NOTE: You must also have the optional Advisor license in order to view the tab correctly. Otherwise you will see a notification that you are not licensed for Advisor. In addition, access to the Advisor tab is controlled by the administrator on a user-by-user basis.

The Advisor data feed is updated on a regular basis as new vulnerabilities are reported. It contains two parts:

- **Alert Data:** Information relating to known security vulnerabilities and threats
- **Attack Data:** Normalization of intrusion detection signatures and vulnerability scanning plug-ins

The following intrusion detection and intrusion prevention systems are supported by Advisor:

- Cisco Secure IDS
- Enterasys Dragon Host Sensor
- Enterasys Dragon Network Sensor
- ISS BlackICE PC Protection
- ISS RealSecure Desktop
- ISS RealSecure Network
- ISS RealSecure Server Sensor
- ISS RealSecure Guard
- Snort/Sourcefire
- Symantec ManHunt
- Symantec Intruder Alert
- McAfee IntruShield

The following enterprise vulnerability scanners are supported by Advisor:

- Database Scanner
- Foundstone
- Internet Scanner
- nCircle IP360
- Nessus
- Phalanx
- QualysGuard
- Retina
- System Scanner
- Wireless Scanner

Viewing Advisor Data

Advisor data can be viewed in two ways: by right-clicking on an event with an attack signature, or by running reports from the Advisor tab of the Sentinel Control Center.

NOTE: Until the initial datafeed is completely loaded, Advisor will not be fully functional.

Viewing Advisor Data using right-click menu option

To View Advisor Data:

1. You may view using right-click menu options from:
 - Active Views Tab
 - Click on *Active Views* tab.
 - Incidents
 - Click on *Incidents* tab.
 - In the Events tab, you will see the associated events.
 - Analysis Offline Query
 - Click on *Analysis* Tab.
 - Go to Offline Query and highlight a Query and click *Browse*.
 - Event grid will display in active browser.
 - Analysis Historical Query
 - Click on *Analysis* Tab > *Historical Query*.
 - You will see Event Grid in the *Query* tab and the *Active Browser Tab*.
2. Select and right-click on an event or a set of events from the Event Grid.
3. From the right-click menu options, select *Analyze* > *Advisor data*.
4. A new window with Advisor data will appear.

NOTE: The right-click function will not be fully operational until the first download of Advisor data has been fully loaded into the database.

NOTE: You can analyze advisor data only if the selected event are from the intrusion detection systems (IDS's) supported by advisor.

NOTE: Data in Advisor database must be up-to-date for accurate results.

Running Advisor Reports

To create an Advisor report:

1. Click the *Advisor* tab.
2. In the Advisor Navigator, click a report template.
3. Click *Advisor* > *Create Report*.
4. Complete the information in the template and click *View Report*.

Maintaining Advisor

To be effective, the Advisor data must be updated on a regular basis. The Advisor data feed can be configured to run regularly scheduled updates, or it can be updated manually.

For more information on creating regularly scheduled updates, see [Configuring Advisor](#) while installation in [Sentinel 6.0 Installation Guide](#)

Standalone Installation – Advisor Manual Updating

If you have chosen Standalone Installation of Advisor in the Sentinel installer, follow the procedure given below to update Advisor data manually. The script `advisor.sh` (for UNIX) and `advisor.bat` (for Windows) will update the database and then delete the attack and alert downloaded files that were unzipped into the attack and alert directories.

To update Advisor Feed:

1. Go to url <https://advisor.esecurityinc.com/advisordata/>.
2. Enter your username and password.
3. Go to the latest month under the attack and alert folders and download the zip files.
4. Place the new alert and attack feed data files (zip files) on your computer.

NOTE: Do not place the zip file in the attack and alert directories.

5. Unzip the attack feed zip files to:

For Windows:

```
<location specified during install for Advisor data files>\attack
```

or

For UNIX:

```
<location specified during install for Advisor data files>/attack
```

6. Unzip the alert feed zip files to:

For Windows:

```
<location specified during install for Advisor data files>\alert
```

or

For UNIX:

```
<location specified during install for Advisor data files>/alert
```

7. Go to:

For Windows:

```
%ESEC_HOME%\bin
```

For UNIX:

```
$ESEC_HOME/bin
```

8. Run the following command:

For Windows:

```
advisor.bat
```

For UNIX:

```
./advisor.sh
```

NOTE: `advisor.sh` and `advisor.bat` will update the database and then delete the attack and alert files that were unzipped into the attack and alert directories.

Direct Internet Download – Advisor Manual Updating

If you have chosen Direct Internet Download of Advisor in the Sentinel installer, follow the procedure given below to update Advisor data manually.

To update Manual Advisor Feed – Direct Internet Download:

1. Go to:
For Windows:
`%ESEC_HOME%\bin`
For UNIX:
`$ESEC_HOME/bin`
2. Run the following command:
For Windows:
`advisor.bat`
For UNIX:
`./advisor.sh`

NOTE: `advisor.sh` and `advisor.bat` will update the database and then delete the attack and alert files that were unzipped into the attack and alert directories.

Changing Your Advisor Server Password

For the Standalone installation, use the instructions below to request a new Advisor password. The new Advisor Server password will be entered manually every time you download updated Advisor data.

For the Direct Download installation, an extra step is required so that the Advisor Server password will be encrypted and stored in a configuration file for automatic downloads.

To change your Advisor server password:

1. Submit a password change to [Novell Technical Support](http://support.novell.com/phone.html?sourceidint=suplnav4_phonesup) (http://support.novell.com/phone.html?sourceidint=suplnav4_phonesup).
2. Novell will send you a new password.
3. Perform the following steps if you are using the Direct Download configuration for Advisor. For UNIX login as Sentinel Administrator User or for Windows login with administrative rights.
4. Go to:
For UNIX:
`$ESEC_HOME/bin`
For Windows:
`%ESEC_HOME%\bin`
5. Enter the following commands:
For UNIX:
`./adv_change_passwd.sh <newpassword>`
For Windows:
`adv_change_passwd.bat <newpassword>`

Changing Your Advisor Server Email Configuration

To change your Advisor server email configuration:

1. For UNIX login as Sentinel Administrator User or for Windows login with administrative rights.
2. Go to:
For UNIX:
`$ESEC_HOME/config`
For Windows:
`%ESEC_HOME%\config`
3. Open `alertcontainer.xml` and `alertcontainer.xml` in a text editor and make changes to the highlighted areas shown below.

```
<property
  name="advisor.mail.from">fromNAME@domain.com</pro
  perty>

<property
  name="advisor.mailto.list">toNAME@domain.com</pro
  perty>
```

NOTE: To send messages to more than one address, enter email addresses as comma separated, without spaces.

Changing the Scheduled Data Update Time

When installing Advisor in Direct Download mode, the administrator can choose to update Advisor on a 6-hour or 12-hour schedule. By default, the data update times are:

- Six Hour: 01:00, 07:00, 13:00 and 19:00
- Twelve Hour: 02:00 and 14:00

To change the Advisor scheduled update times:

1. Login to your Advisor machine (for UNIX login as Sentinel Administrator User).
2. To edit your data feed times:
For UNIX: use the 'crontab' command
For Windows: use the 'at' command

9

Event Source Management

The topics included in this chapter:

<u>Topic</u>	<u>Page</u>
Understanding Event Source Management	9-1
Introduction to the User Interface	9-2
Live View	9-8
Components of Event Source Hierarchy	9-11
Adding Components to Event Source Hierarchy	9-12
Adding Connectors/Collector Plug-ins	9-13
Adding a Collector	9-15
Debugging Collectors	9-15
Adding a Connector	9-17
Adding an Event Source	9-17
Adding Event Source Servers	9-17
Event Source Management Scratchpad	9-30
Comparison between Sentinel 5.x and Sentinel 6.0	9-30

Understanding Event Source Management

Event Source Management (ESM) panel provides a set of tools to manage and monitor connections between Sentinel and its event sources.

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

The Event Source Management tools available in the ESM panel include the following:

- Graphical and tabular views of the configuration of connections to event sources with the real-time status of these connections overlaid.
- Configuration wizard to assist the user in adding and editing connections to event sources.
- Various other tools that allow the user to investigate the status of connections to event sources, monitor the data flowing through them, and debug collectors.
- Export and import configuration wizards that allow the user to export their configuration to a file and later import it back.

Through ESM, you may:

- 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.
- 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 “Live View and Scratchpad”.

Collector Workspace and Collector Directory

Collector Workspace is the location where collectors that you create or you want to modify using Collector Builder, are stored. The collectors are stored in %ESEC_HOME%\data\collector_workspace

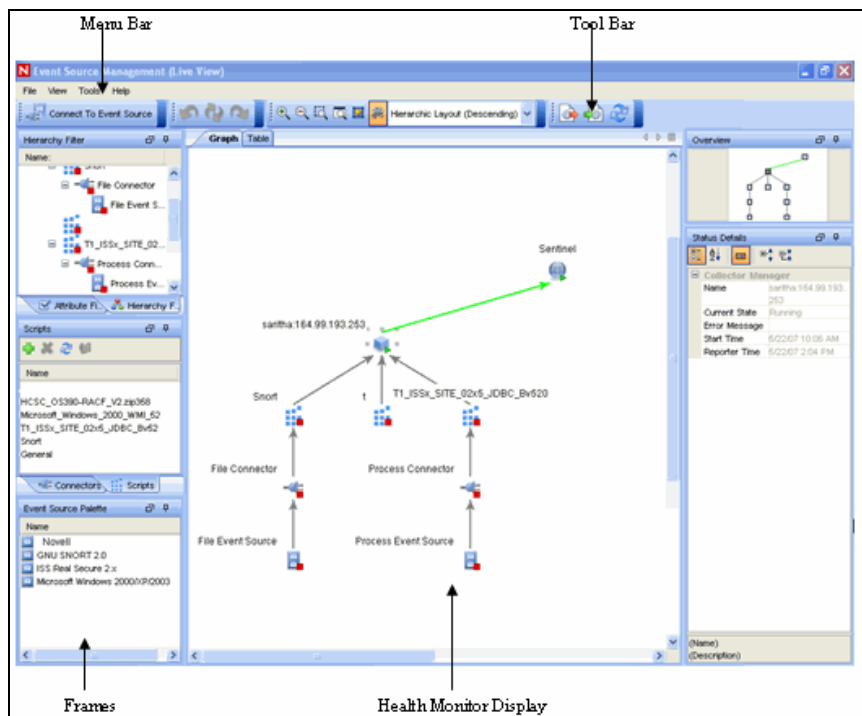
Collector_instances is the directory where the running collectors are stored. They are stored on the system where Collector Manager is installed. The running collectors are stored in %ESEC_HOME%\data\collector_mrg.cache\collector_instances

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 when you work on ESM.

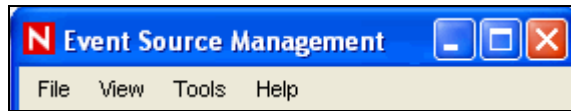
The Event Source Management windows have:

- Menu Bar with the ESM menus
- Tool Bar which helps you execute the functions of ESM
- Frames with several attributes
- Display Health Monitory frame with graph and table views where you can perform your activities



Menu Bar

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



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

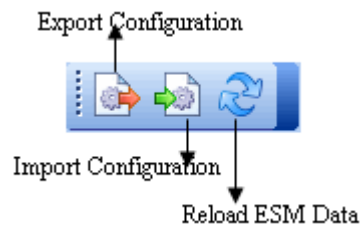
These options allow you to perform a set of actions mentioned below:

Tool Bar

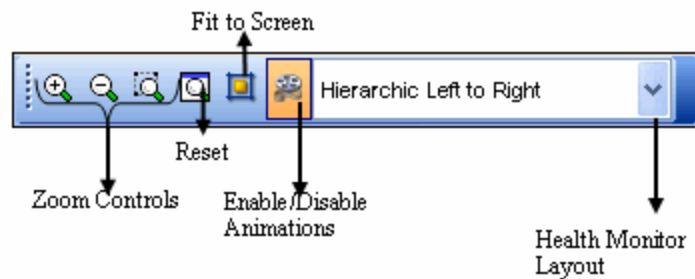
The Tool Bar allows you to perform different activities through the Tool Bar buttons.



Import/Export & Reload Event Source Management Data buttons.

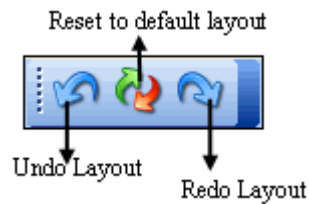


Additionally, the tool bar has zoom function which allows you to zoom in/out or a selected object on the Health Monitor Display Frame. You may enable/disable animations during transition from one layout to the other in the Graph view of the Health Monitor Display. The Fit to Screen option adjust



the ESM view to fit the screen.

You may reset to the default settings too.

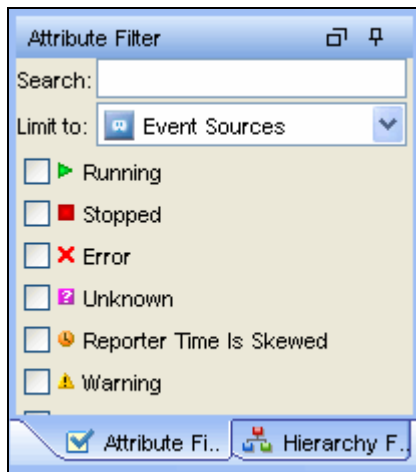


Frames

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

Attribute Filter

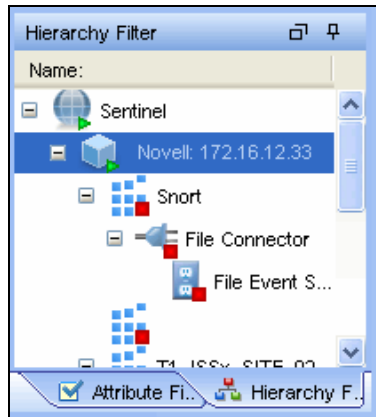
The Attribute Filter allows you to filter to display the components of ESM. You can specify the components to be displayed based on the component name and status.



- **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 will be shown.

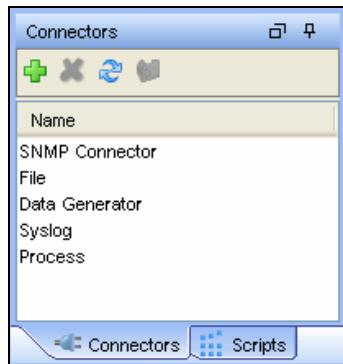


To set Hierarchy filter for displaying components:

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

Connectors

Connectors are plug-ins in Sentinel. Importing a Connector would implement the connector mechanism in the system. Connectors frame allows you to Add, Remove and Refresh connectors and Add auxiliary file in the system.



Add

Add Connectors to the system.



Delete

Delete Connectors.



Refresh

Refreshes the list.



Add
Auxiliary
Files

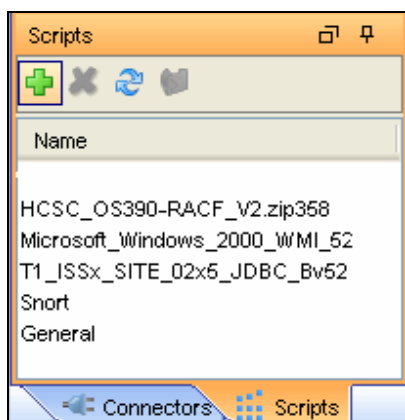
Add Auxiliary Files. For more
information, see “Add Auxiliary Files”

To add Connector Plug-ins:

1. In Sentinel Control Center, click on the *Event Source Management* in the menu bar and select Live View or Scratch Pad.
2. Click on the Script or Connectors frame. You can plug-in connectors from here. For more information, see “Add Plug-In”.

Scripts

Collectors are plug-ins in Sentinel. The Collector Script plug-in adds the ability to parse raw data from an event source. Scripts frame allows you to import plugins, remove collectors, refresh the list of collectors and add auxiliary files in the system.



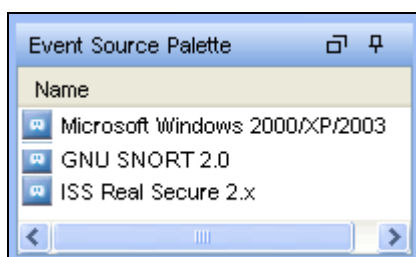
	Add	Add Scripts to the system.
	Delete	Delete Collectors.
	Refresh	Refreshes the list.
	Add Auxiliary Files	Add Auxiliary Files. For more information, see “Add Auxiliary Files”.

To add Collector Plug-ins:

1. In Sentinel Control Center, click on the *Event Source Management* in the menu bar and select Live View or Scratch Pad.
2. Click on the Script or Connectors frame. You can plug-in collectors from here. For more information, see “Add Plug-In”.

Event Source Palette

This frame will display the list of Devices or Event Sources supported by the existing Collectors in the Central Repository.

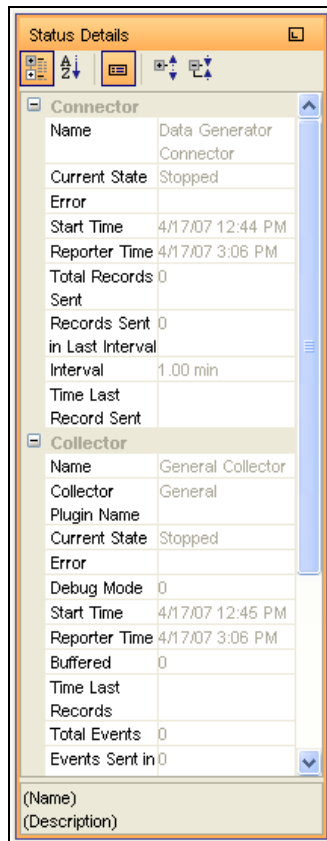


Status Details

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

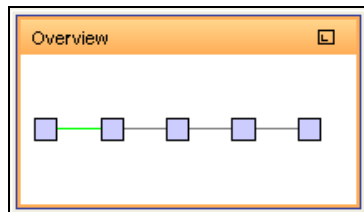
Available status information includes the current state, the number bytes processed, the number of records sent, the number of Sentinel™ Events sent, and various other status and statistical information.

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



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.



Plug-in Repository

A plug-in is a package of code that provides additional functionality to Sentinel and the most common plug-ins are Collector Scripts and Connectors.

- **Collector Script:** The Collector Script plug-in adds the ability to parse raw data from an Event Source. This is similar to the Collector Script in Sentinel 5, however in Sentinel 6 the plug-in also provides additional meta-data to enable the ESM panel to prompt the user for parameter values as well as enable ESM to automatically choose supported connection methods that work well with the Collector Script. This meta-data is added to the Collector Script plug-in by the plug-in developer.
- **Connector:** In Sentinel 6, all Connectors are pluggable. A Connector plug-in contains both the implementation of the connection mechanism as well as the GUI screens

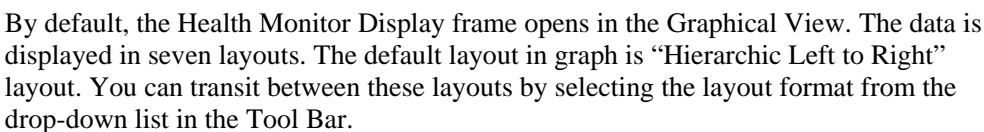
- **Hot Fixes and New Functionality:** In the future, some Sentinel enhancements and defect fixes may be available as plug-ins.
- Once you import a plug-in into Sentinel, it is centrally stored in the Plug-in Repository. The appropriate Sentinel components on other machines will automatically start using the plug-in.

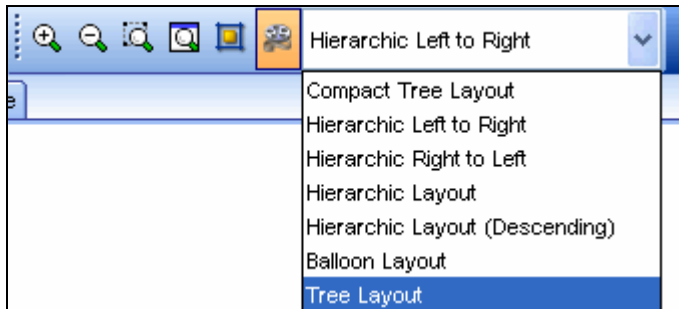
Some plug-ins such as database Connectors, require one or more auxiliary files in order to function. Auxiliary files are any such files that can not be included with the standard plug-in files such as user-specific configuration file or third party libraries that require specific licenses.

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

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

The Graph 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.





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.

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.

Graph 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.

To change the ESM view from Graphical to Tabular and vice-versa:

1. In the Live View, click on the Table Tab to move to Tabular view and Graph tab to move back to the Graphical View.

Right-click Menu

The Health Monitor Display View provides a set of right-click menus that will help 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: Only if the parent nodes are running, the selected object starts up.

- **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 ie, live view to scratchpad and vice versa. Cloning an object will Copy all the settings except “Run” checkbox setting that is, if an object is in running state and it is cloned then the status of the cloned object will be stopped. (For example, Name, parent ESM and so on).
- **Remove:** You may delete a selected object from the system.
- **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.
- **Add Event Source:** 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:** You can add a Collector Manager by selecting this option by right clicking the action of sentinel in ESM (Scratchpad).

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

Components of Event Source Hierarchy

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










NOTE: ESM allows you to add Collector, Event Source and Connector.

	Sentinel	The single Sentinel icon represents the main Sentinel™ Server that manages all events collected by the Sentinel system.
	Collector Manager	Sentinel is installed through the Sentinel installer. Each Collector Manager icon represents another instance of a Collector Manager process. Multiple Collector Manager processes can be installed throughout the system.
	Collector	The term Collector refers to a deployed instance of a Collector Script which includes the specification of the Collector Script to use as well as the parameter values the Collector should run with.
	Connector	The term Connector refers to a deployed instance of a Connector plug-in which includes the specification as well as the parameter values the Connector should run with.
	Event Source	Each Event Source represents a configured Event Source connection, including the Collector Script, the Connector type (For example, file, syslog, WMI), and configuration parameters.
	Event Source Server	Each Event Source Server icon represents another configured Event Source Server. An Event Source Server is a process that collects data from specific event source types and passes it on to associated Event Sources.

Component Status Indicators

Indicators are used to represent various states as follows:

	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.

	Reporter Time is Skewed	See the individual component's status display for details about the error.
	Debug	Indicates when the time of a component differs from the main server's time. (The difference is greater than a predefined time threshold.)
	Unknown	Indicates that the component is in "Debug" mode. Only a Collector can be in Debug mode.
		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 on the *Event Source Management* in the menu bar and select Live View or Scratch Pad.
2. Click on the Attribute Filter frame.
3. Enter 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 on the *Event Source Management* in the menu bar and select Live View or Scratch Pad.
2. Click on the Attribute Filter frame.
3. Enter the Search and Limit to criteria.
4. Select the component type by which to limit the view.

Adding Components to Event Source Hierarchy

Collectors, Connectors and Event Sources may also be added to the system through the right-click menus on the main ESM display.

Collectors

To run the Collectors and generate the Events as per your requirements, you need to:

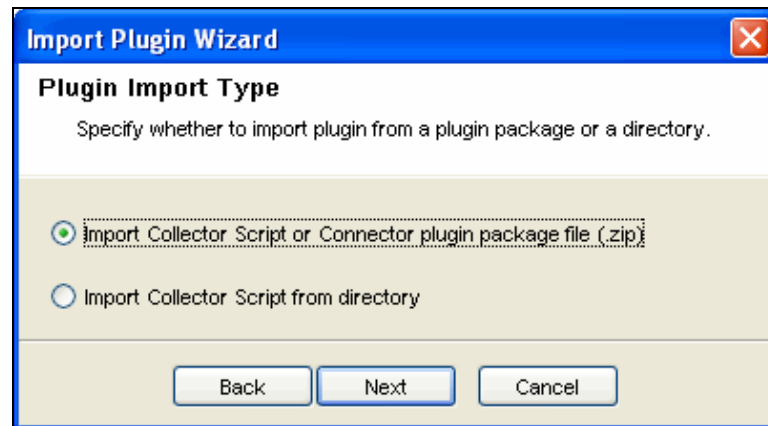
- Download Collectors from [Novell Collector Download](http://support.novell.com/products/sentinel/collectors.html) page (<http://support.novell.com/products/sentinel/collectors.html>).
- Import and Deploy Collectors
 - After downloading Collectors, import and deploy the Collectors.
- Generate Events
 - Start (Right-click on 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 **"Debugging Collectors"**.
- Edit Collectors
 - To troubleshoot any misbehavior of a Collector, you can edit the Collector. To edit Collectors, copy the Collector Script to a machine that has Collector Builder installed.
 - For more information on editing Collectors, see *Sentinel 6.0 Collector Builder User's Guide*.
- Re-Import and deploy Collectors

Adding Connectors/Collector Plug-ins

NOTE: When you use the Sentinel Control Center to browse to locate a file on the Desktop of the Collector Manager, clicking Desktop will take you to the Desktop of the user running the Collector Manager, usually SYSTEM. Extra steps may be necessary to navigate to the correct users desktop.

To add a Connector plug-in:

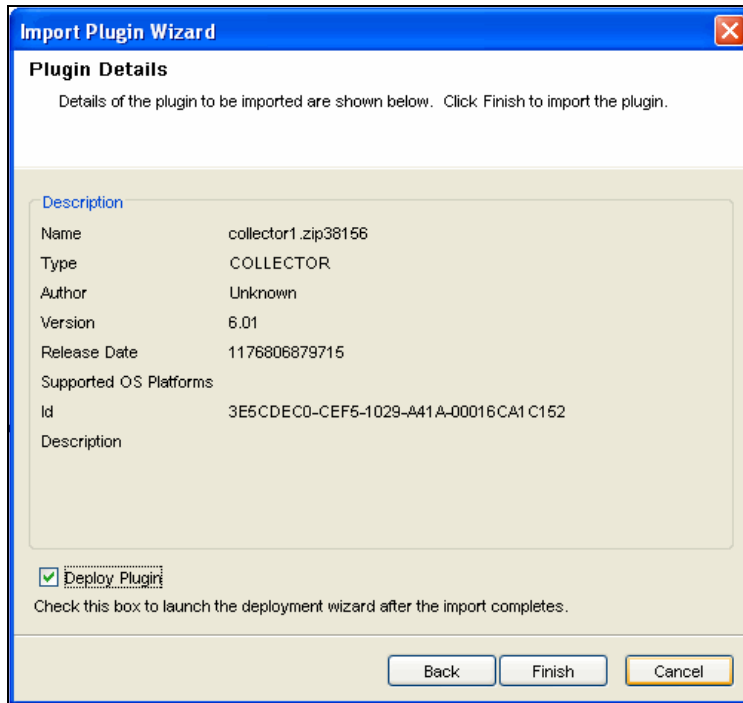
1. Click *Tools* on the Menu Bar and select *Import plugin...* Import Plugin wizard will display.



2. You may choose from the two options given in this screen. Click *Next*.
3. Browse to a location of the Connector Plug-in 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 plug-in package, system will display an error message.

4. Plug-in details window will display. Check the Deploy Plug-in option to deploy the plug-in from this window. For more information, see “Connect to Event Source”.

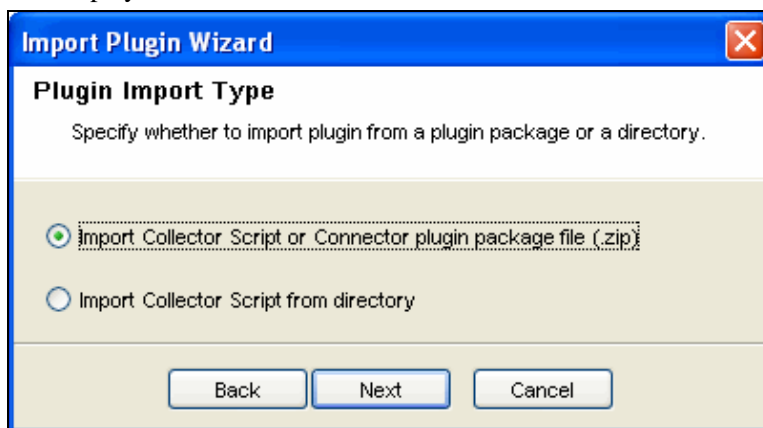


5. Click *Finish*.

NOTE: When you add a plug-in into Sentinel, it is placed in the Plug-in Repository, which enables Sentinel components on other machines to start using the plug-in without having to add the plug-in separately.

To add a Collector plug-in:

1. Click *Tools* on the Menu Bar and select *Import plugin...* Import Plugin wizard will display.



2. You may choose from the two options given in this screen. 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 will display.
 - a. Click the button next to id field to generate UUID.

- b. The name and author details are displayed. Edit the details as per your requirement. Enter the Version number.
- c. Browse and attach the help file.

NOTE: If the help file is not in the plug-in directory, the system prompts to copy the help file to the plug-in directory before import. Click *Yes*.

- d. Enter description and click *Next*. Supported Devices window will display.

NOTE: You must specify at least one device.

Click *Add*. The Supported Devices window will display.

Enter 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. Plug-in details window will display. Check the Deploy Plug-in option to deploy the plug-in from this window. For more information on deployment procedure, see “Connect to Event Source”.
6. Click *Finish*.

Adding a Collector

To add a Collector:

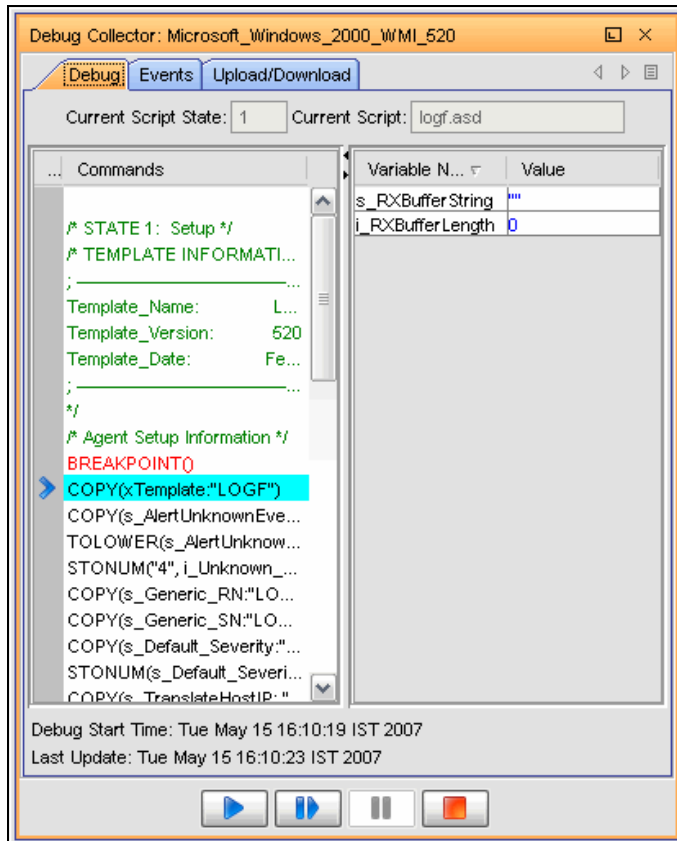
1. In the main ESM display, locate the Collector Manager to which the new Collector will be associated.
2. Right-click on the Collector Manager and select the *Add Collector* menu item.
3. Follow the prompts in the *Add Collector* Wizard.
4. Click *Finish*.

NOTE: Collector Script enables the ESM panel to prompt you for parameter values as well as enable ESM to automatically choose supported connection methods that work well with the Collector Script.

Debugging Collectors





In the Debugging Collector window, 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 will expand 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.



The Events tab will display the events generated using this Collector and the Upload/Download tab will allow you to upload/download another Collector Script file to make modifications.

The debugger has the following four controls:

	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 will not be 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 may 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 on 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.

Adding 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 on the Collector and select the *Add Connector* menu item.
3. Follow the prompts in the *Add Connector* Wizard.
4. Click *Finish*.

Adding an Event Source

To add an Event Source:

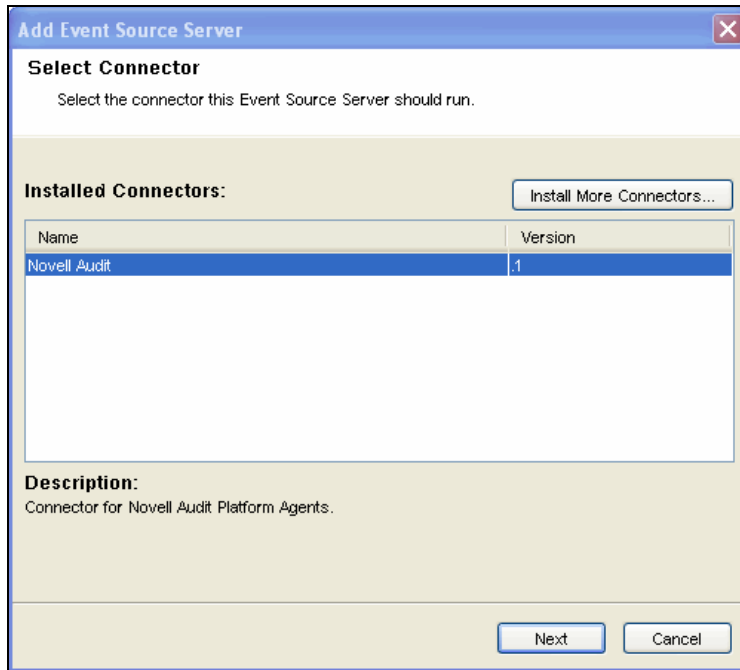
1. In the main ESM display, locate the Connector to which the new Event Source will be associated.
2. Right-click on the Connector and select the *Add Event Source* menu item.
3. Follow the prompts in the *Add Event Source* Wizard.
4. Click *Finish*.

Adding 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 on the Collector Manager and select *Add Event Source Server*. Select Required connector window will display.



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 would support your device and click *Next*. If you do not have any connectors in the list that would support your device, click *Install More Connectors*. For more information on installing connector, see “Add Plug-in”.
3. Configure the various parameters for the server with reference to the connector selected (For example, syslog connector, NAudit connector, HTTPS connector and so on.). The configurable parameters will be different for the different Connector types. Click *Next*.
4. Enter a Name for the Event Source Server. If you would 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 will appear 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.

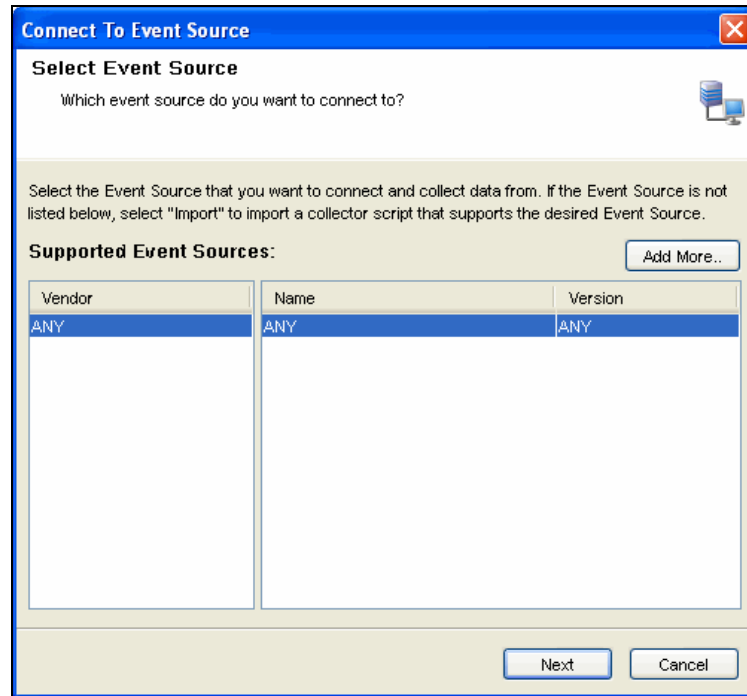
To deploy an event source, you need the following components:

- **Collector Script:** Collector scripts may be downloaded from [Novell web site \(http://support.novell.com/products/sentinel/collectors.html\)](http://support.novell.com/products/sentinel/collectors.html), copied from a previous Sentinel implementation (4.x or 5.x), or built using Collector Builder
- **Connector:** Connector may be downloaded from [Novell web site \(http://support.novell.com/products/sentinel/collectors.html\)](http://support.novell.com/products/sentinel/collectors.html)
- Configuration information for the event source

Collector Scripts and Connectors built by Novell can be found on the [Novell web site \(http://support.novell.com/products/sentinel/collectors.html\)](http://support.novell.com/products/sentinel/collectors.html).

To connect to the Event Sources:

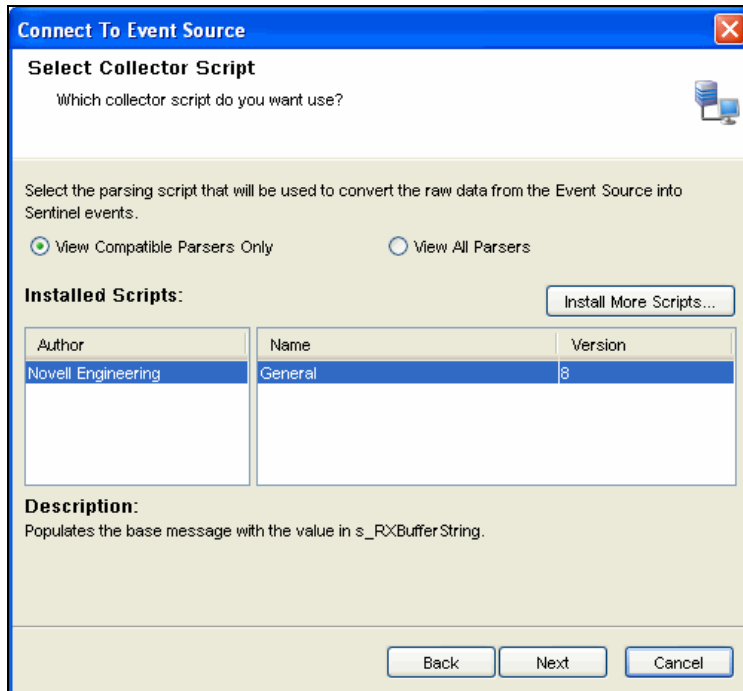
1. Click *Tools* on the Menu Bar and select *Connect to Event Source*. Alternatively, you may also click the *Connect to Event Source* button on the Tool Bar. Connect to Event source window will display.



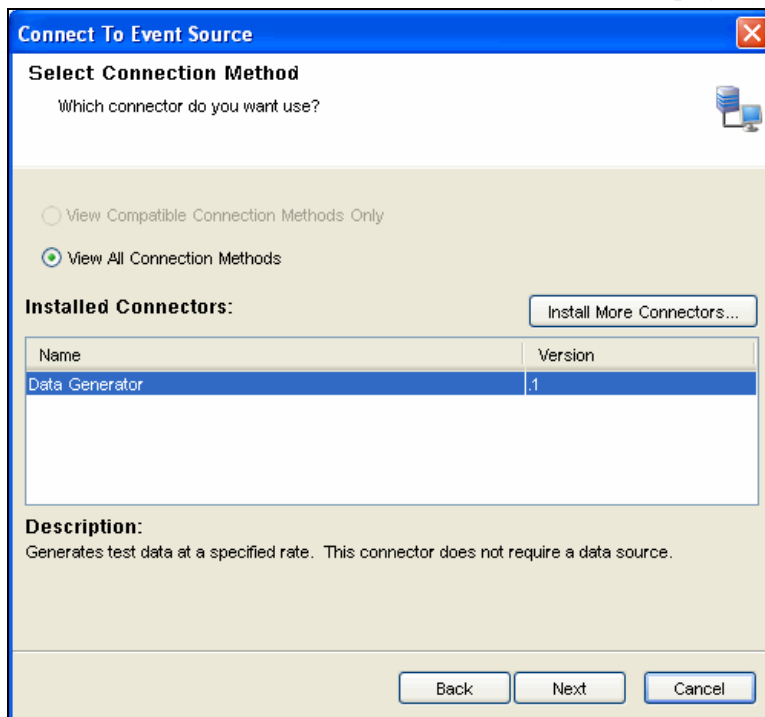
NOTE: Event Source types for which you currently have compatible Collector parsing scripts will be listed here.

2. Select an Event Source from the list to which you want to connect to and collect data from. You may click *Add More* to import an Event Source. Click *Next*. Select Collector Script window will display.

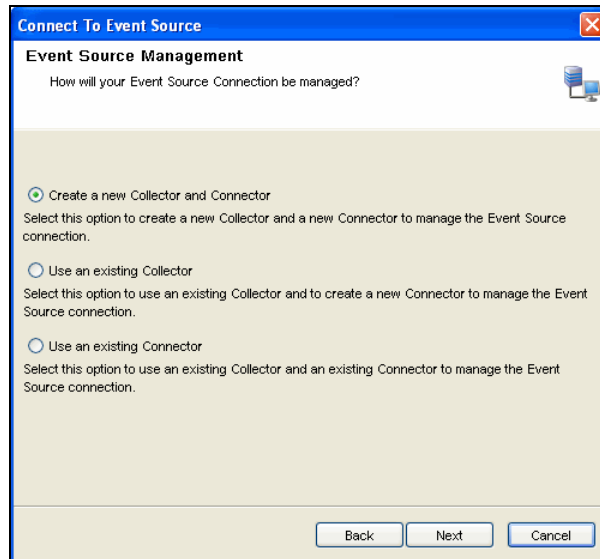
NOTE: You can open “Select Collector Script” screen by double clicking or dragging a selected event source from the “Event Source Palette” window.



3. Select a collector script from the list. You may 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 “Add Plug-in”. Click *Next*. Select Connection Method window will display.



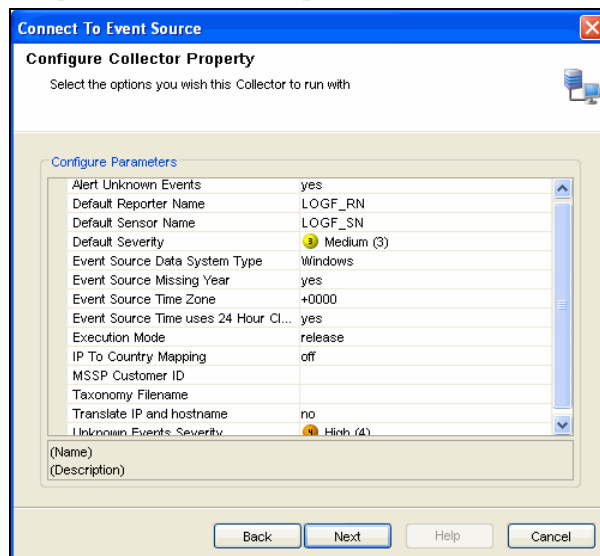
4. Select a connection method from the list. You may also install additional connectors by clicking on the Install More Connectors button. For more information, see “Add Plug-in” to install connectors. Click *Next*. Event Source Management window will display.



5. You may create a new Collector and Connector, may 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 may be unavailable.

- **Create a new Collector and Connector:** Select this option to create a new Collector and Connector to manage the Event Source connection.
 - a. After you select this option and click *Next*, *Select Collector Manager* window will display.
 - b. Select the Collector Manager you want to use and click *Next*. *Configure Collector Property* window will display.



- c. Configure the parameters available and click *Next*. *Configure Collector* window will display.
- d. Enter 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 plug-in details.

- You may set alerts (with repeated option) if no data is received in a specific period.
- You may limit the data rate as maximum number of records per second.
- You may set filter through *Set Filter* button.

Click *Next*. The Configure Connector window will display.

- Enter 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 plug-in details.
 - You may set alerts (with repeated option) if no data is received in a specific period.
 - You may limit the data rate as maximum number of records per second.
 - You may set filter through *Set Filter* button.

Click *Next*. The Event Source configuration screens will display.

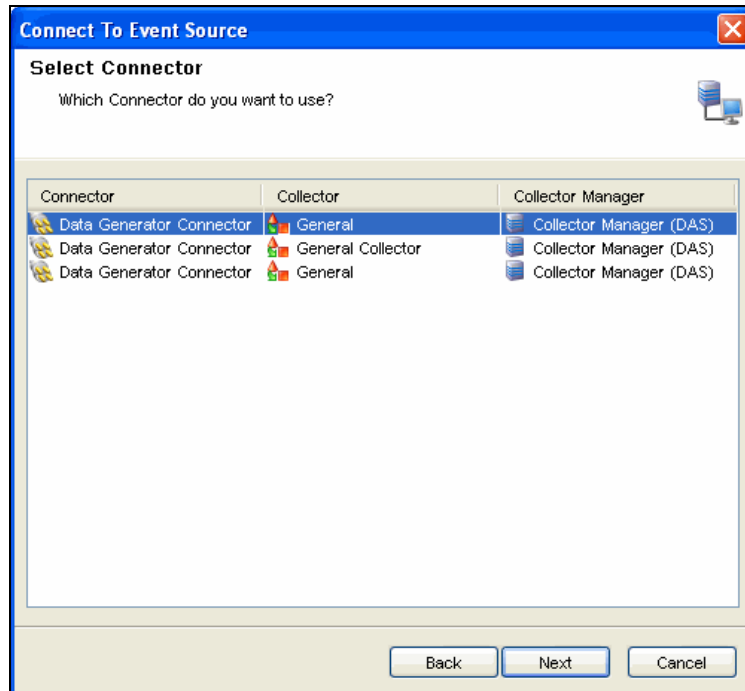
- **Use an existing Collector:** Select this option to use an existing Collector and to create a new Connector to manage the Event Source connection.

- After you select this option and click *Next*, the Select Collector window will display.
- Select the Collector you want to use and click *Next*. The Configure Connector window will display.
- Enter 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 plug-in details.
 - You may set alerts (with repeated option) if no data is received in a specific period.
 - You may limit the data rate as maximum number of records per second.
 - You may set filter through *Set Filter* button.

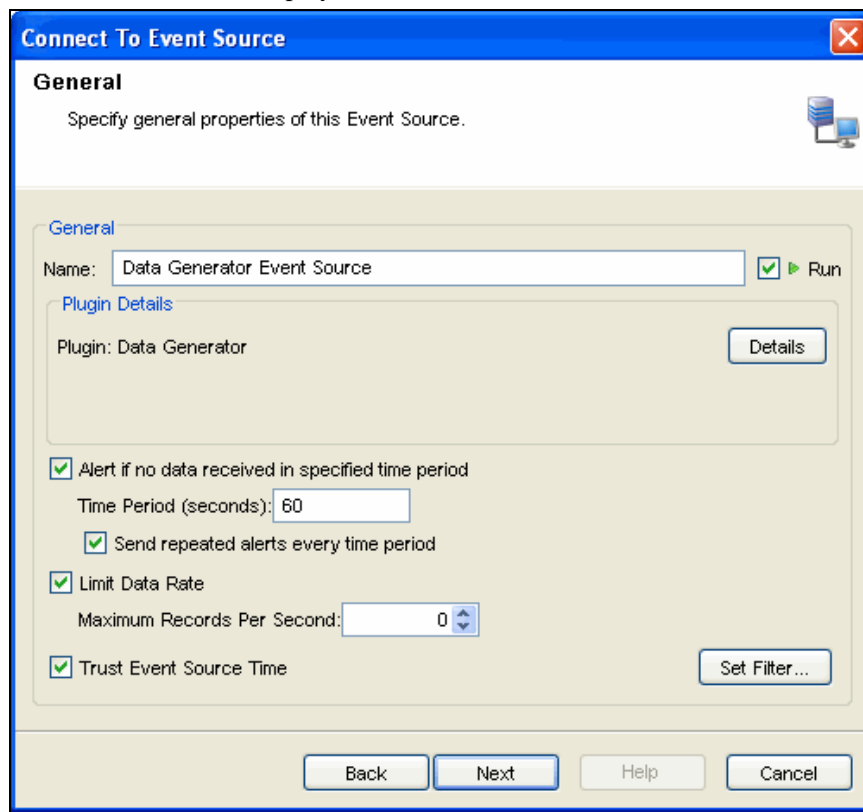
Click *Next*. The Event Source configuration screens will display.

- **Use an Existing Connector:** Select this option to use an existing Collector and an existing Connector to manage the Event Source connection.

- After you select this option and click *Next*, The Select Connector window will display.

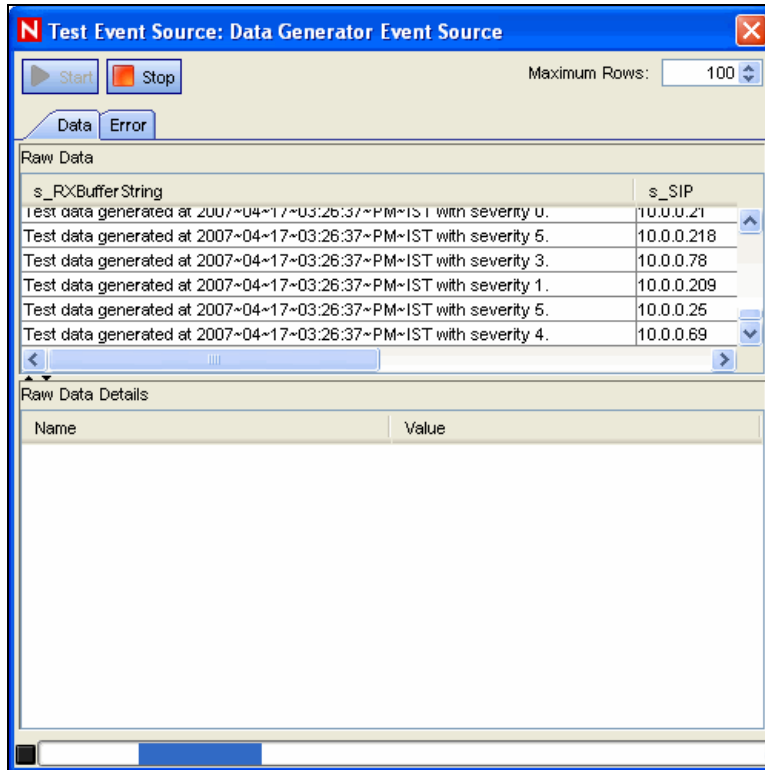


- b. Select the connector you want to use and click *Next*.
6. The Records Per Second window will display.
7. Set the number of records to be transferred per second and click *Next*. The General window will display.



- Enter Name of the Event Source.

- Check the *Run* checkbox if you want to run your Event Source automatically.
 - Click *Details* button to see plug-in details.
 - You may set alerts (with repeated option) if no data is received in a specified time interval.
 - You may limit the data rate as maximum number of records per second.
 - You may select to trust the Event Source Time.
 - You may set filter through *Set Filter* button. In the filter window, add/edit the filters and click *OK*.
8. Click *Next*. The Summary window will display.
- Click *Test Connection* to test the event source. Test Event Source window will display 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* on successful test of the Event Source.

NOTE: The Collector parsing script will be executed on the same system as the Collector Manager that you choose here.

Export Configuration

Export configuration helps you export the configuration of ESM objects along with their collector script and the connector plugins.

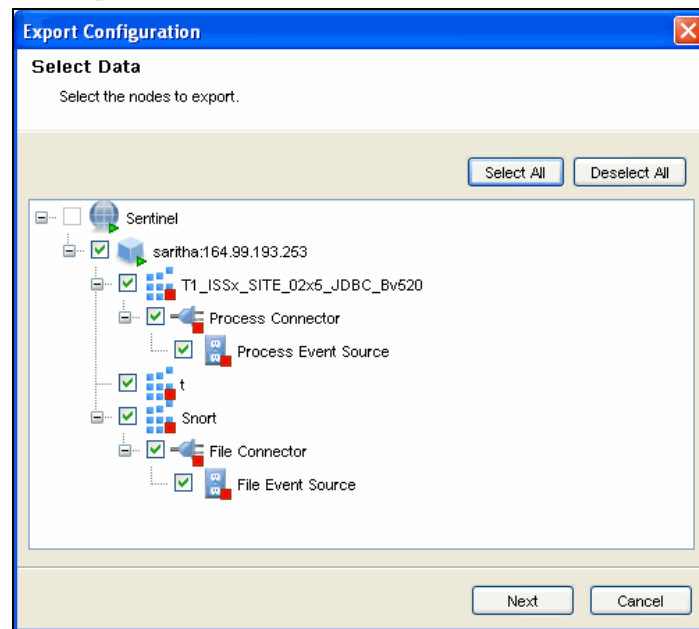
NOTE: You can export any object in the ESM panel. Depending on the object selected, all its children and parent should be displayed in the Select Data window of Export Configuration wizard.

To export your configurations:

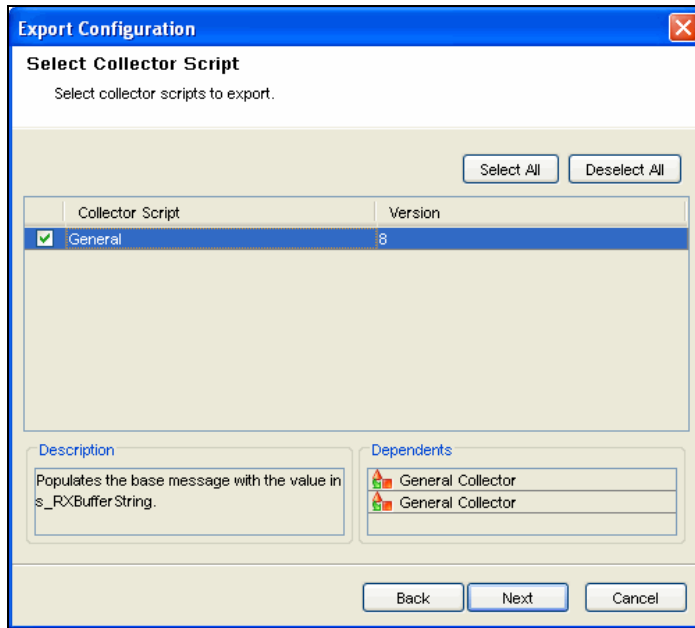
1. Click *File* on the Menu Bar and select *Export Configuration*. You may also click



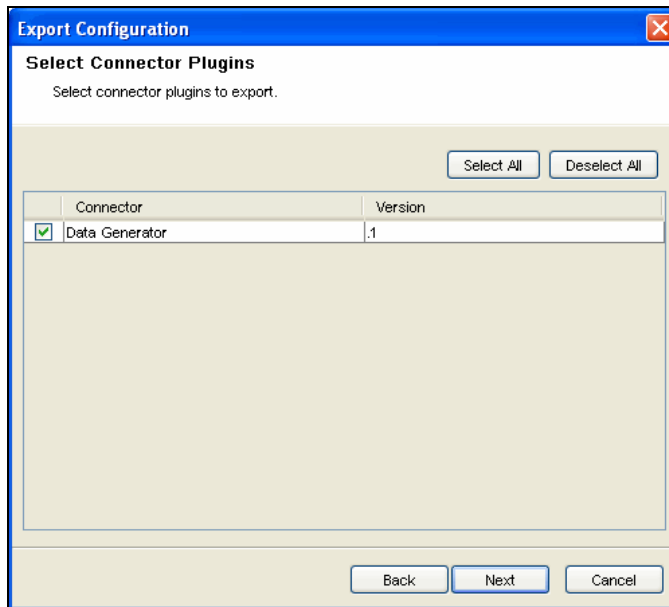
on the *Export Configuration* button on the Tool Bar or right click an object in the ESM panel and select Export Configuration. Export Configuration window will display.



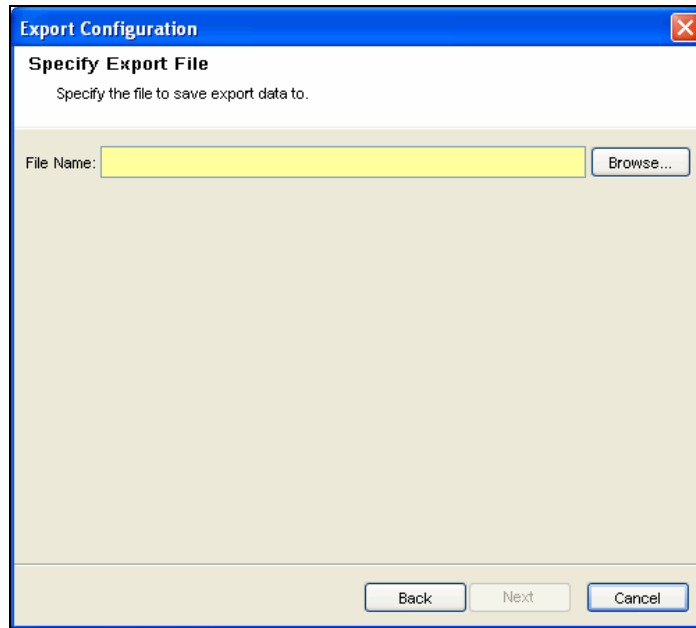
2. Check the data to export and click *Next*. Select Collector Scripts window will display.



3. Select the Collector scripts from the list to export. You may select or deselect all. Click *Next*. Select Connectors Plug-in window will display.



4. Select the Connector Plug-ins from the list to export. You may select or deselect all. Click *Next*. Specify Export File window will display.



NOTE: If you want to view the description and dependents of a particular plugin in the above screens, 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 will display.
7. Click *Finish* to export. The file is exported in zip format.

Import Configuration

Import configuration helps you to import the configuration of ESM objects exported to a zip file along with the plugins

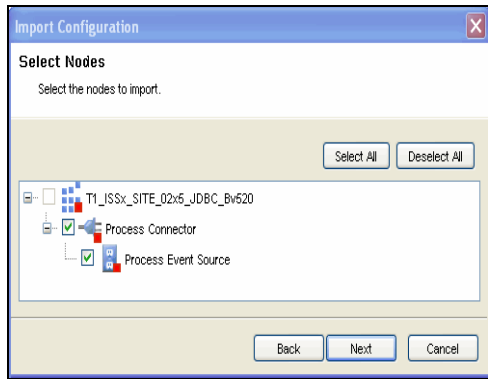
To import your configurations:

1. Click *File* on the Menu Bar and select *Import Configuration*. You may also click

on the *Import Configuration* button  on the Tool Bar. Import Configuration window will display.

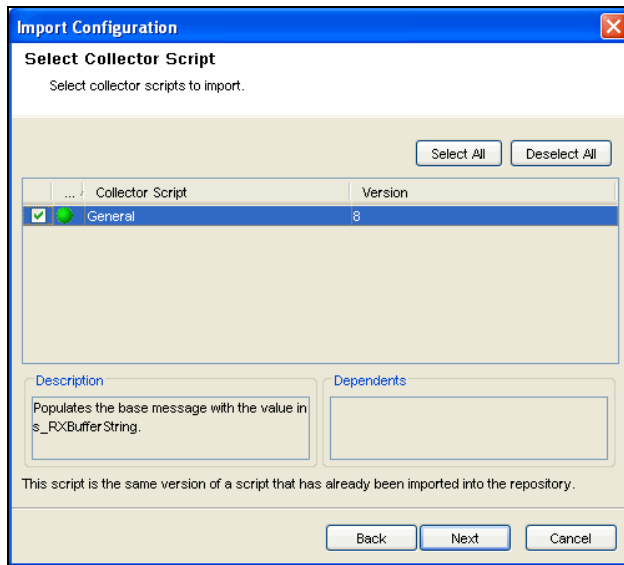
NOTE: You can also import configuration by right clicking on the object in the ESM panel. Depending on the object you have selected in the ESM panel, the node along with its child nodes are displayed in the Select Data window of Import Configuration wizard.

2. Browse and select the configurations file and click *Next*. Select Data screen will display.



NOTE: Configurations must be saved to a zip file to import.

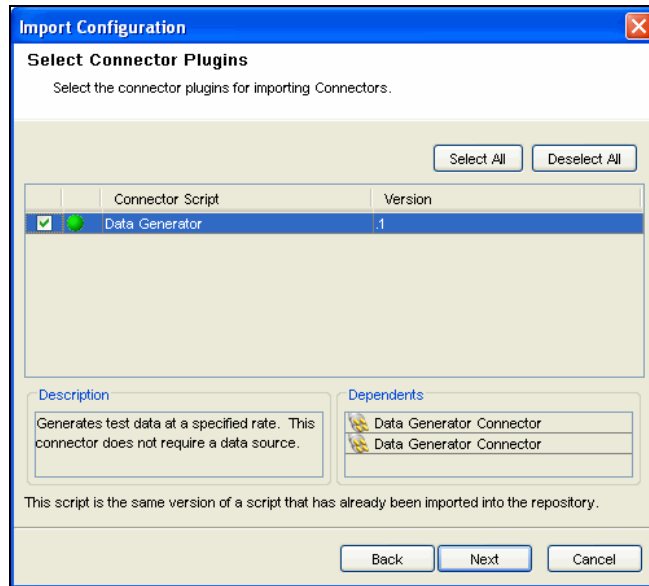
3. Check the data to import and click *Next*. Select Collector Script window will display.



4. Select the collector script from the list to import.

NOTE: Color indicator is displayed in Select Collector Scripts and Select Connector Plugins screens 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 will display.



6. Select the connector plugins from the list to import.

NOTE: To view the description and dependents of a particular plugin in the above screens, select that plugin from the table. If there are any collectors or connectors in the ESM panel which will get affected on importing the plugin then “Affected Collectors” or “Affected Connectors” screens will be displayed.

7. Click *Next*. Summary page with the details of the configurations and plugin selected to import will display.
8. Click *Finish*.

Save Preferences

To save your preferences for next login:

1. Click *File* on the Menu Bar and select *Save Preferences*.

Close

To close ESM:

1. Click *File* on the Menu Bar and select *Close*.

Reset Layout

To reset to default settings:

1. Click *View* on the Menu Bar and select *Reset Layout*. Alternatively, you may also click the *Reset* button on the Tool Bar.

Undo Layout

To undo layout changes:

1. Click *View* on the Menu Bar and select *Undo Layout*. Alternatively, you may also click the *Undo Layout* button on the Tool Bar.

Redo Layout

To redo layout changes:

1. Click *View* on the Menu Bar and select *Redo Layout*. Alternatively, you may also click the *Redo Layout* button on the Tool Bar.

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 may right-click on the Sentinel icon and add the components. For more information, see “Adding components to Event Source Hierarchy”.

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.

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.

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 on the Collector node you would like to debug and select the “Debug” option.
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 plug-ins in 6.0. A Collector Script plug-in must be added to the plug-in 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 plug-ins, which must be added to plug-in 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.	

10 Administration

The topics included in this chapter:

<u>Topic</u>	<u>Page</u>
Understanding Admin Tab	10-1
Introduction to User Interface	10-2
Archive Configuration Tab	10-2
Server Views	10-6
Filters	10-8
Configure Menu Options	10-13
DAS Statistics	10-18
Mapping	10-22
Color Filter Configuration	10-19
Event Configuration	10-30
Reporting Data	10-35
User Configurations	10-40

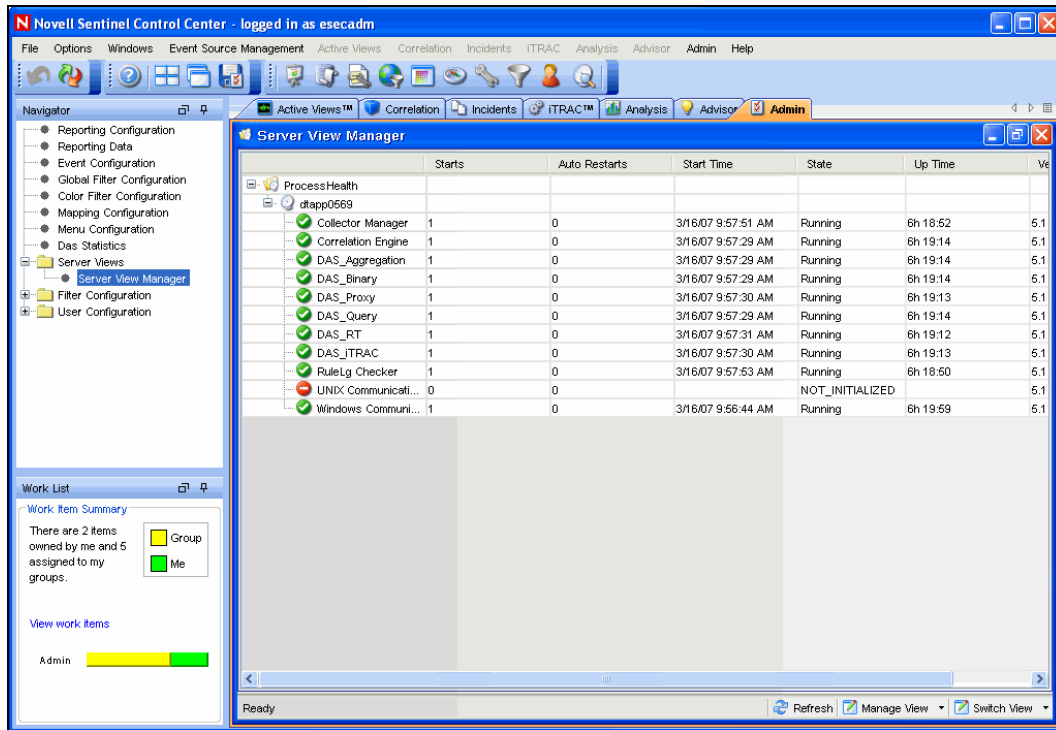
Understanding Admin Tab

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:

- “Archive”
- “Reports”
- “Views”
- “Filters”
- “Menu Options”
- “DAS Statistics”
- “Events File Information”
- “Color Filter”
- “Mapping”
- “Events”
- “Reporting Data”
- “Users”

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.

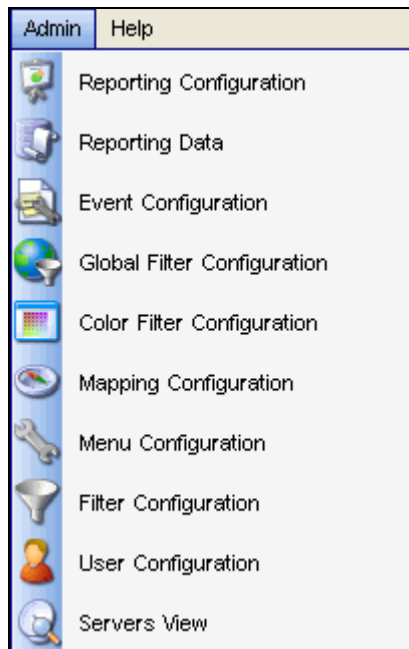


Introduction to User Interface

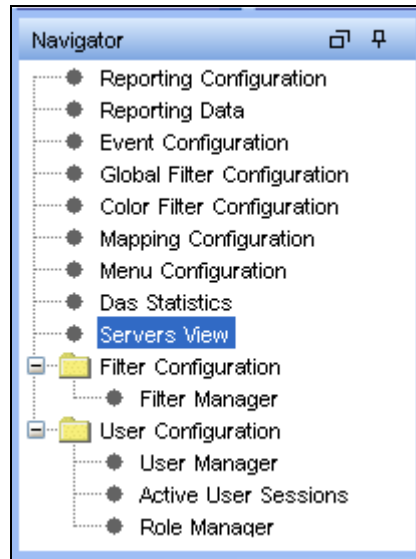
In Admin Tab, you can see Server views, Filter Configuration and User Configuration in the Admin Navigator.

You may navigate to these functions from:

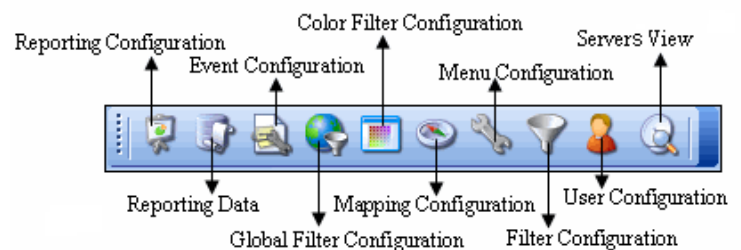
- The Admin menu in the Menu Bar



- The Navigation Tree in the Navigation Pane



- The Toolbar Buttons



Archive Configuration Tab

Archive Configuration Tab allows you to enter directory path for archiving of the partitions.

To open Archive Configuration:

1. Click *Admin* on the Menu Bar and select Archive Configuration. Alternatively, click *Archive Configuration* button in the Tool Bar.

NOTE: Archive Configuration can be enabled from User Manager. Only an Administrator has controls to enable/disable access to this feature.

Reporting Configuration Options for Analysis and Advisor Reports

To configure the URL for Analysis and Advisor Reports:

1. Click *Admin* tab.
2. In the *Admin Navigator*, click *Reporting Configuration*.

For Crystal Enterprise Server running on Windows:

- In the Analysis URL box, enter the URL for the Crystal Enterprise Server and click *Refresh*.

```
http://<hostname_or_IP_of_web_server>/GetReports.as
p?APS=<hostname>&user=Guest&password=&tab=Analysi
s
```

NOTE: <hostname_or_IP_of_web_server> must be replaced with the IP address or hostname of the Crystal Enterprise 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, enter the URL for the Crystal Enterprise Server and click *Refresh*.

```
http://<hostname_or_IP_of_web_server>/GetReports.as
p?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 Enterprise Server.

NOTE: The URL above will not work properly if the APS is set to the IP Address. It must be the host name.

NOTE: For more information, see [Crystal Reports for Windows in *Sentinel 6.0 Installation Guide*](#).

For Crystal Enterprise Server running on Linux (SUSE and Red Hat):

- In the Analysis URL box, enter the URL for the Crystal Enterprise 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
```

NOTE: <hostname_or_IP_of_web_server> must be replaced with the IP address or hostname of the Crystal Enterprise Server.

NOTE: The URL above will not work properly if the APS is set to the IP Address. It must be the host name.

NOTE: <web_server_port_default_8080> must be replaced with the port of the Crystal web server is listening on.

- In the Advisor URL box, enter the URL for the Crystal Enterprise Server and click *Refresh*.

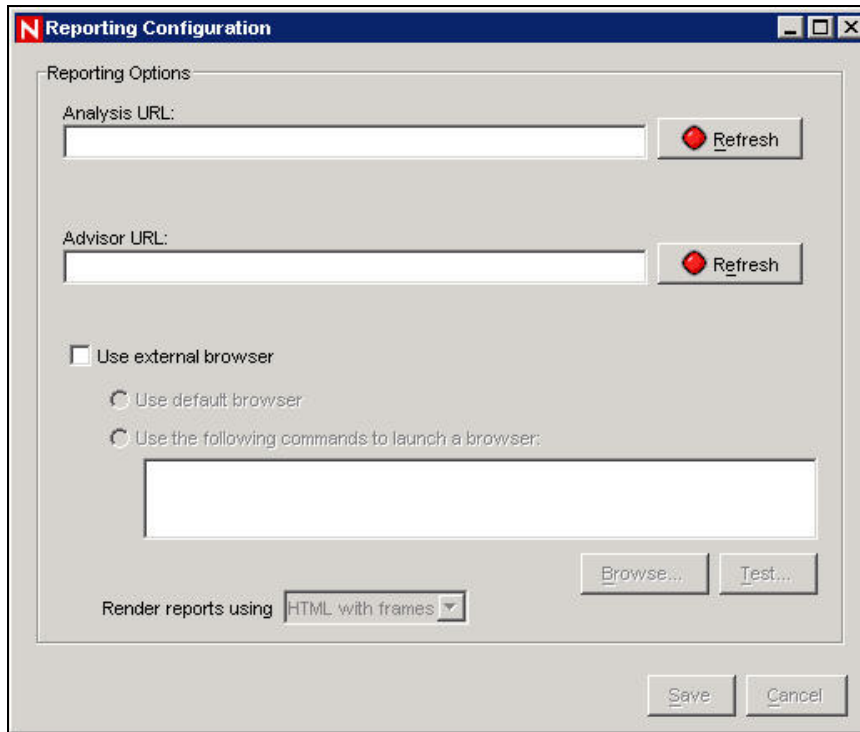
```
http://<hostname_or_IP_of_web_server>:<web_server_port_default_8080>/esec-script/GetReports.jsp?APS=<hostname>&user=Guest&password=&tab=Advisor
```

NOTE: <hostname_or_IP_of_web_server> must be replaced with the IP address or hostname of the Crystal Enterprise Server.

NOTE: The URL above will not work properly if the APS is set to the IP Address. It must be the host name.

NOTE: <web_server_port_default_8080> must be replaced with the port of the Crystal web server is listening on.

NOTE: For more information, see [Crystal Reports for Linux in *Sentinel 6.0 Installation Guide*](#).



The image shows a 'Reporting Configuration' dialog box with a title bar containing a red 'N' icon and standard window controls. The dialog is divided into a 'Reporting Options' section and a bottom section with 'Save' and 'Cancel' buttons. In the 'Reporting Options' section, there are two text input fields: 'Analysis URL:' and 'Advisor URL:'. Each field has a 'Refresh' button to its right, which features a red diamond icon. Below these fields are three radio button options: 'Use external browser' (which is selected), 'Use default browser', and 'Use the following commands to launch a browser:'. The third option is followed by a large empty text area. At the bottom of the 'Reporting Options' section, there is a 'Render reports using' label and a dropdown menu currently set to 'HTML with frames'. To the right of this dropdown are 'Browse...' and 'Test...' buttons. The 'Save' and 'Cancel' buttons are located at the bottom right of the dialog.

The external browser option allows you to use your default or another 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 will have to logout of the Sentinel Control Center and login again.

Server Views

Through Server 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.

	Starts	Auto Restarts	Start Time	State	Up T...	Version
ProcessHealth						
ct-app0401						
Collector_Manager	0		4/6/07 10:26:23 AM	Running	26:03s	6.0.0.0
Correlation_Engine	0		4/6/07 10:26:23 AM	Running	26:04s	6.0.0.0
DAS_Aggregation	0			NOT_INITIALIZED		6.0.0.0
DAS_Binary	0			NOT_INITIALIZED		6.0.0.0
DAS_Proxy	0			NOT_INITIALIZED		6.0.0.0
DAS_Query	0			NOT_INITIALIZED		6.0.0.0
DAS_RT	0			NOT_INITIALIZED		6.0.0.0
DAS_IJRAC	0			NOT_INITIALIZED		6.0.0.0
UNIX Communicati...	0			NOT_INITIALIZED		6.0.0.0
Windows Communi...	0			NOT_INITIALIZED		6.0.0.0

- **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 would 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. Since 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, due to an error) and was automatically restarted by Sentinel Watchdog.

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 image.

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*.
 - Enter 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*.

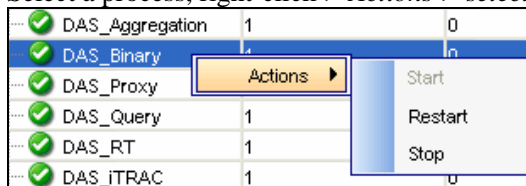
Starting, Stopping and Restarting Processes

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 image. Select a process, right-click > *Actions* > *select a function (Start, Restart or Stop)*.



NOTE: You cannot stop the Windows Communication Server and Unix Communication Server using this feature.

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 wish 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:

- “Public Filters”
- “Private Filters”
- “Global Filters”

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.

Filter Manager		
Owner	Filter Name	Expression String
PUBLIC	Operating_System_Events	filter(e.DeviceCategory = "OS")
PUBLIC	Database_Events	filter(e.DeviceCategory = "DB")
PUBLIC	IDS_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

Private Filters

Private filters are user-owned. Private filters are display filters and are shareable if you have the View Private Filters permission.

Global Filters

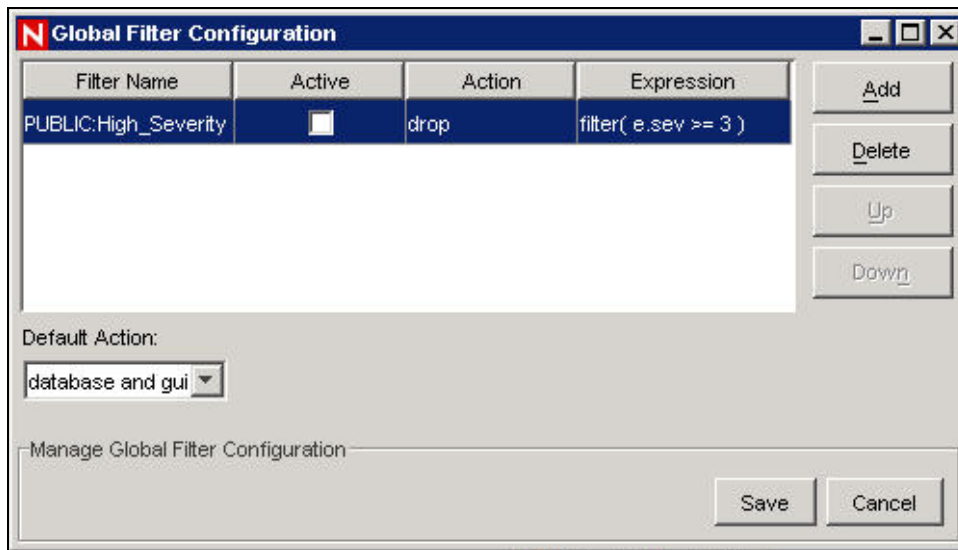
Global filters are classified as Public Filters. Global filters are processed at the Collector Manager sequentially for each event until a match is found. Global filter evaluation stops for that event and the matched global filter action is taken for that event. The order of evaluation of global filters is top to bottom, as shown in the Console. They can be enabled or disabled as needed.

Global filters do the following:

- Enable a global action on events, such dropping events, routing events to the database only or routing events to the database and the Sentinel Control Center or Routing events only to GUI or Sentinel Control Center
- Are processed by Collector Manager
- Are configured in the Admin tab under the Global Filter Configuration option where they can be enabled and disabled
- Drop events
- Can route events to the database only
- Can route events to the database and to the Sentinel Control Center
- Can route events only to Sentinel Control Center

Through the Global Configuration window, you can:

- “Create Global Filter”
- “Rearrange a Global Filter”
- “Delete a Global Filter”



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. Select a filter and click *Select* or *Add* (if you need to create a filter).
6. In the Active column, click *Active* box.
7. In the Action column, select the 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 action determines how the event is handled.

You can set the Default Action box to one of the following:

- **drop:** Events will not go to the Sentinel Control Center or the Sentinel Server database
 - **database:** Events will be sent directly to the database, bypassing the Sentinel Control Center
 - **database and gui:** Events will be sent to the Sentinel Control Center and Sentinel Server database
 - **gui only:** Events will be sent to the Sentinel Control Center.
8. Continue adding filters until you are finished.
 9. 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, you will not get a confirmation message.

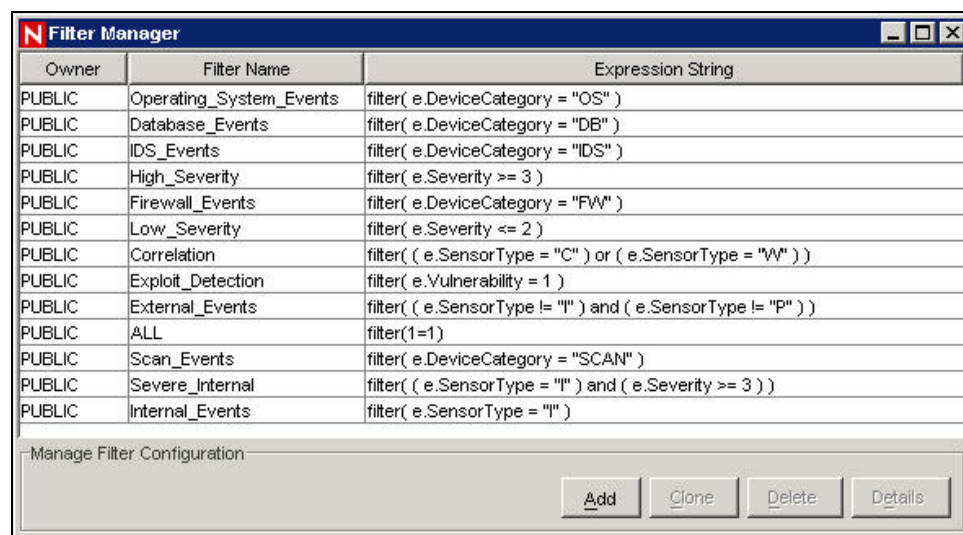
To delete a global filter:

1. In the Global Configuration window, Select a filter from the list and click *Delete*.
2. Click *Save*.

Configuring Public and Private Filters

Configuring Public and Private filters allows you to:

- “Add a Filter”
- “Clone a Filter”
- “Modify a Filter”
- “View the Details of a Filter”
- “Delete a Filter”



Owner	Filter Name	Expression String
PUBLIC	Operating_System_Events	filter(e.DeviceCategory = "OS")
PUBLIC	Database_Events	filter(e.DeviceCategory = "DB")
PUBLIC	IDS_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 = "V"))
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

Adding a Filter

To add a public and private filter:

1. Click *Admin* tab.
2. Click *Admin > Filter Manager* or select *File Manager* under the *Filter Configuration* folder in the navigator.
3. Click *Add*.
4. Select an Owner ID (public or private [user owned]).

Filter Details

Filter Properties:

Owner ID: PUBLIC

Filter Name: PUBLIC (selected), psecadm, user5

Use free form editor

Property	Operator	Value	Value2

Match if:

☒ All conditions are met (and)

☐ One or more conditions are met (or)

Expression string:

filter()

Save Cancel

5. Enter a Filter Name.
6. 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, once the expression is modified with the free form editor, the table editor cannot be used with the expression.

7. Select the criteria for the following columns:
 - Property
 - Operator
 - Value columns.

Your choices display in the Expression string box.
8. In the Match if box, click either:
 - All conditions are met (and)
 - One or more conditions are met (or)
9. To create another filter expression, click *Create a New Filter Expression (+)* to add another row to the filter expression table.
10. To remove a filter expression, select a filter expression from the table and click *Remove the Selected Expression (-)*.
11. 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*.
3. Enter a new filter name.
4. Change any the original filter's criteria.
5. Click *Save*.

Modifying a Public and Private Filter

To modify a Public and Private filter:

1. Open the Filter Manager.
2. Select a filter and click *Details*.
3. Change any of the criteria as desired. You will not be able to change the Owner ID and the *Filter Name*.
4. 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*.
3. A confirmation window will open. Click *Yes* in delete confirmation dialog.

Configure Menu Options

NOTE: To use this feature, you must have the user permission Menu Configuration.

Use the Menu Configuration window to create the menu items that appear on the Event menu, which displays on any table displaying an event (For example, Event Real Time window, Snapshot window, Incidents Events window and so on.) when you select one or more events and right click. Sentinel has the following default Menu Configuration items that you can clone, activate or deactivate:

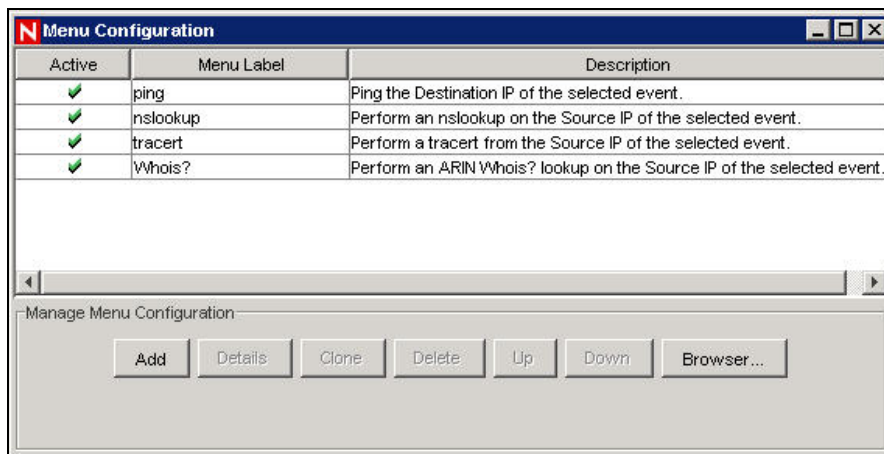
- **Ping:** Ping the destination IP of the selected event
- **nslookup:** Perform an nslookup on the Source IP of the selected event
- **tracert (tracert on Microsoft SQL 2005):** Perform a traceroute from the Source IP of the selected event to the Sentinel Server
- **Whois?:** Perform an ARIN Whois? lookup on the Source IP of the selected event

NOTE: The configured menus may be placed at \$ESEC_HOME/config/exec (UNIX) / %ESEC_HOME%\config\exec (Windows). Symbolic links on UNIX are not supported.

Menu Configuration allows you to:

- “Adding an Option to the Menu Configuration Menu”
- “Cloning a Menu Configuration Option”
- “Modifying a Menu Configuration Option”
- “Viewing a Menu Configuration Option's Parameters”

- “Activating or Deactivating a Menu Configuration Option”
- “Rearranging Event Menu Options”
- “Deleting a Menu Configuration Option”
- “Editing Your Menu Configuration Browser Setting”



Adding an Option to the Menu Configuration Menu

NOTE: If you renamed a tag, such as renaming CustomerVar24 to PolicyName, you must use the new name when setting parameters.

To add an option to the Menu Configuration menu:

1. Click *Admin* tab.
2. In the Admin Navigator, click *Admin > Menu Configuration*.
3. Click *Add*.
4. In the Menu Configuration dialog box, enter:
 - **Name**
 - **Description**
 - **Action:** Either Execute Command or Launch Web Browser
 - **Use browser:** If you chose the Action “Execute Command” and your Browser settings are setup to “Use External Browser” (For more information, see “Editing Your Menu Configuration Browser Settings” for editing Browser settings), you have the option to select Use browser. Selecting this option will cause the output of your command to be displayed using the Menu Configuration Browser settings for your Sentinel Control Center.
 - **File Type:** If you chose the Action “Execute Command”, your Browser settings are setup to “Use External Browser”, and you selected the option “Use browser”, you have the option of setting the File Type for the output of this command.
 - **Command /URL**

NOTE: For UNIX, the script/application must be located in the \$ESEC_HOME/config/exec directory. For any script or application only enter the command. Any path entered will be ignored.

NOTE: For Windows (Correlation), the script/application must be located in one of the directories listed in your Windows Environmental Variables. Any path entered will be ignored.

NOTE: For Windows (non-Correlation), entering a path is optional. Entering a command without a path will default to %ESEC_HOME%\ bin and all other paths specified in your environmental variables.

- **Parameters:** Parameter must be enclosed by the percent sign (For example, %EventName%)

NOTE: For a list of available tags you can use when specifying parameters, click *Help* on the Menu Configuration dialog box or see [Collector and Sentinel Meta-tags in Sentinel 6.0 User's Reference Guide](#).

5. Click *OK*. The new option is added to the list of menu items in the Menu Configuration window.

For an example, highlight any of the default menu items and click *Details*. The following is an nslookup configuration.

The screenshot shows the 'Menu Item' configuration dialog box. It contains the following fields and values:

- Name:** nslookup
- Description:** Perform an nslookup on the Source IP of the selected event.
- Action:** Execute Command (selected from a dropdown menu)
- Use browser:** ☐ (unchecked)
- File type:** (empty text box)
- Command / URL:** nslookup
- Parameters:** %SourceIP%

Cloning a Menu Configuration Option

To clone a Menu Configuration option:

1. Open the Menu Configuration window.
2. Select a menu item from the table and click *Clone*.
3. In the Menu Configuration dialog box, edit:
 - Name
 - Description
 - Action
 - To use a browser or not. For information, see [“Add a browser feature to your Menu Configuration Option”](#).
 - Command/URL
 - Parameters
 - Select an action:
 - Execute Command
 - Launch Web Browser.

NOTE: For a list of available tags you can use when specifying parameters, click *Help* on the Menu Configuration dialog box or see [Collector and Sentinel Meta-tags in Sentinel 6.0 User's Reference Guide](#).

4. Click *OK*. The new option is added to the list of menu items in the Menu Configuration window.

Modifying a Menu Configuration Option

To modify a Menu Configuration option:

1. Open the Menu Configuration window.
2. Double-click a menu option.
3. Type your desired changes and click *OK*.

Viewing Menu Configuration Option Parameters

To view the parameters for a Menu Configuration menu option:

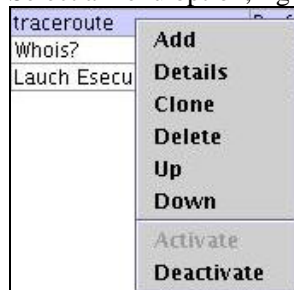
1. Open the Menu Configuration window.
2. Highlight a menu item and click *Details*.

Activating or Deactivating a Menu Configuration Option

To activate or deactivate a Menu Configuration option:

1. Open the Menu Configuration window.

Select a menu option, right-click and select either *Activate* or *Deactivate*.



Rearranging Event Menu Options

To move an Event menu option up or down:

1. Open the Menu Configuration window.
2. Select a menu option and click *Up* or *Down*.

Deleting a Menu Configuration Option

To delete a Menu Configuration option:

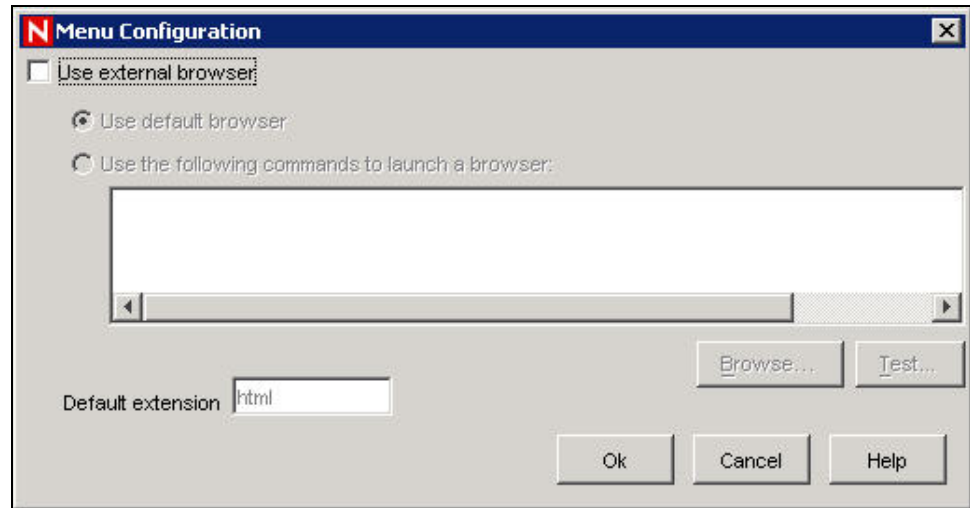
1. Open the Menu Configuration window.
2. Select a menu option and click *Delete*.
 - Click *Yes* to delete the menu option
 - Click *No* to retain the menu option

Editing Your Menu Configuration Browser Settings

This option allows you to send your Menu Configuration Option 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 usually associated with Notepad. You can also choose to launch a specific program, for example you can have a txt file be opened by wordpad or other editor.

To Edit your Menu Configuration Browser Settings:

1. Open the Menu Configuration window.
2. Click *Browser*.

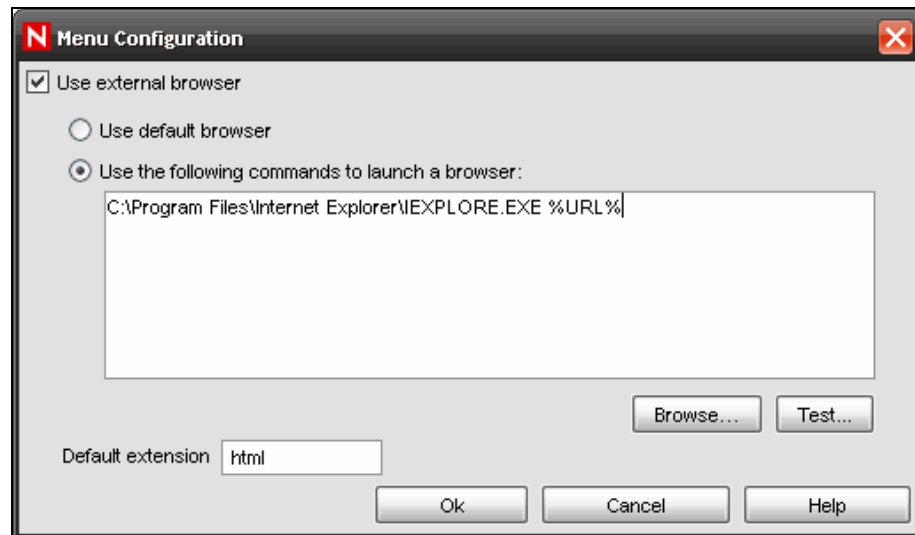


If you check the 'Use external browser' box, you have the option to do one of the following:

- **'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%
```

The following is an example where the output of the Menu Option will launch into Internet Explorer.



3. After you set your configuration, click *OK*.

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 may have 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.

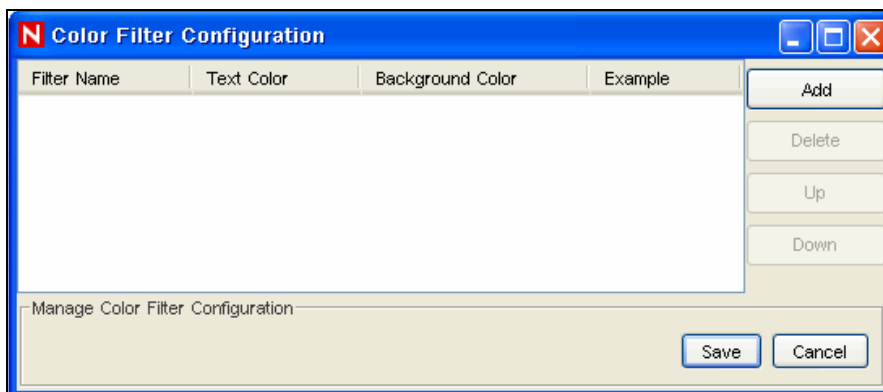
Service	Time	Name	Num	Wait (sec)	Run (sec)	#Waiting	#Running
DAS_RT-0049E98C-DD...	9:00:00 AM						
		ThreadPools	931	0.000	0.211	0.0	0.1
		ThreadPools.Def...	7	0.005	0.096	0.0	0.0
		ThreadPools.Def...	7	0.005	0.096	0.0	0.0
		ThreadPools.RIE...	5	0.009	37.498	0.0	0.1
		ThreadPools.RIE...	5	0.009	37.498	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.esecuri...	371	0.001	0.006	0.0	0.0
		requests.ewizar...	7	0.044	0.096	0.0	0.0
		requests.ewizar...	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 have 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.

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 will be updated.



The Color Filter 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.

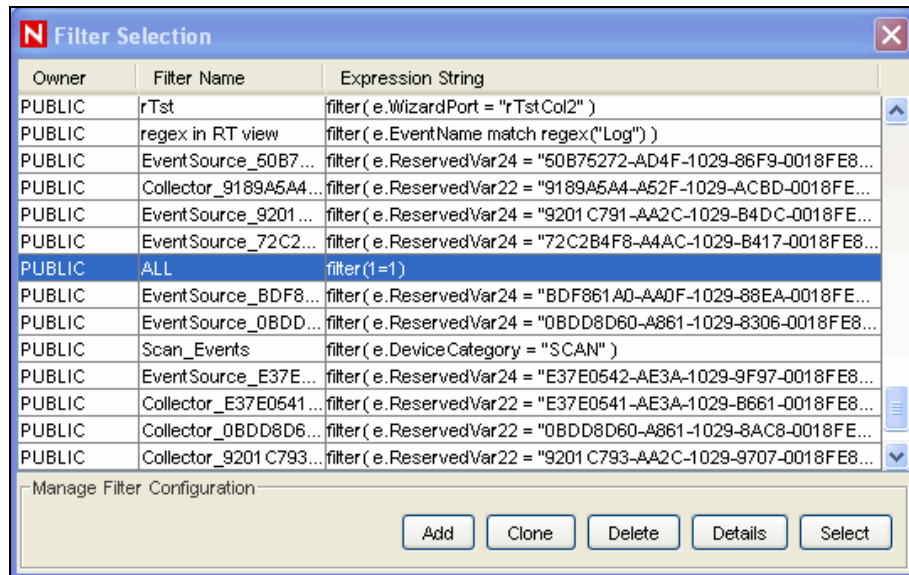
Adding Color Filter

To add a color filter:

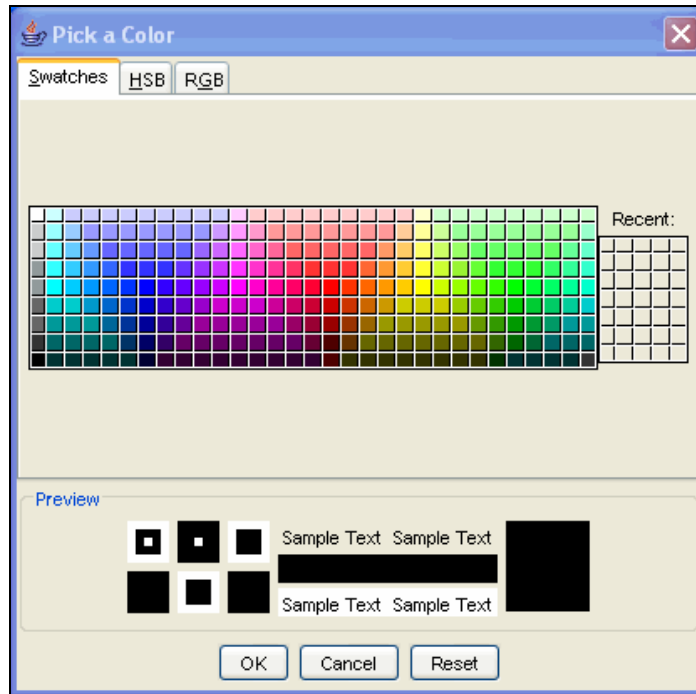
1. Click *Color Filter Configuration* in the navigation pane or click the *Color Filter Configuration* button.
2. Click *Add*. A new Color Filter Configuration row will be created as shown below.

Filter Name	Text Color	Background Color	Example
			Example

3. Click *Filter Name* drop down list. The *Filter Selection* window will display.
4. 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 [“Configuring Public and Private Filters”](#).



5. In the *Color Filter Configuration* window click *Text Color*. The *Pick a Color* window will display. Select a color from the *Swatches* Tab. Alternatively, click *HSB* or *RGB* tab and enter the *HSB* or *RGB* color value in the respective tab. Click *OK*.



6. In the *Color Filter Configuration* window, click *Background Color*. The *Pick a Color* window will display. Select a color from the *Swatches* Tab. Alternatively, click *HSB* or *RGB* tab and enter *HSB* or *RGB* color value in the respective tab. Click *OK*.
7. 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 or click the *Color Filter Configuration* button.
2. Select a *Color Filter Configuration* row.
3. 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.

Mapping


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.

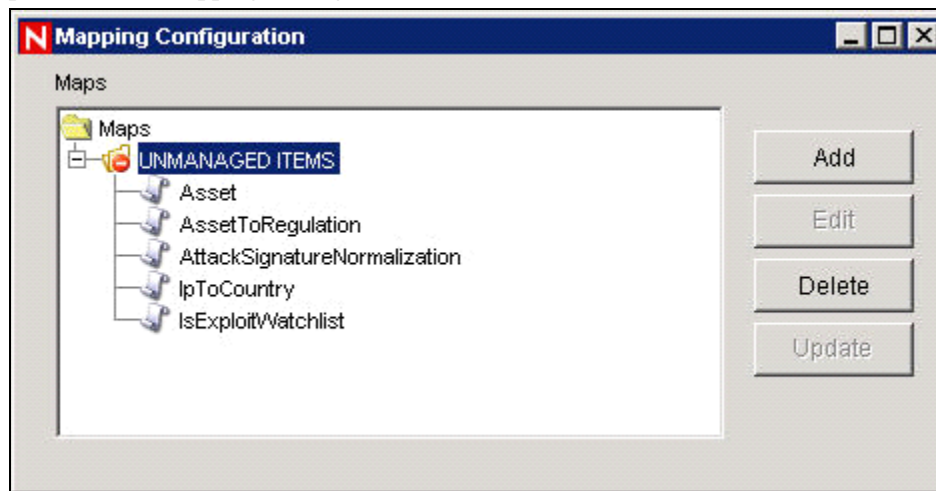
The Mapping tab allows you to:

- Add new map definitions
- Edit map definitions
- Delete map definitions
- Update map data

Mapping works together with the *Referenced from Map* Data Source option under Event Configuration. You can map by using a string or number range.

To view maps in the GUI:

1. Navigate to Admin tab and select Mapping Configuration from the navigation pane or click Mapping Configuration button .



The main Mapping GUI displays a listing of all of the maps that have been defined for the system.

NOTE: Maps under *UNMANAGED ITEMS* folder cannot be edited or deleted.

Adding Map Definitions

To add a map definition:

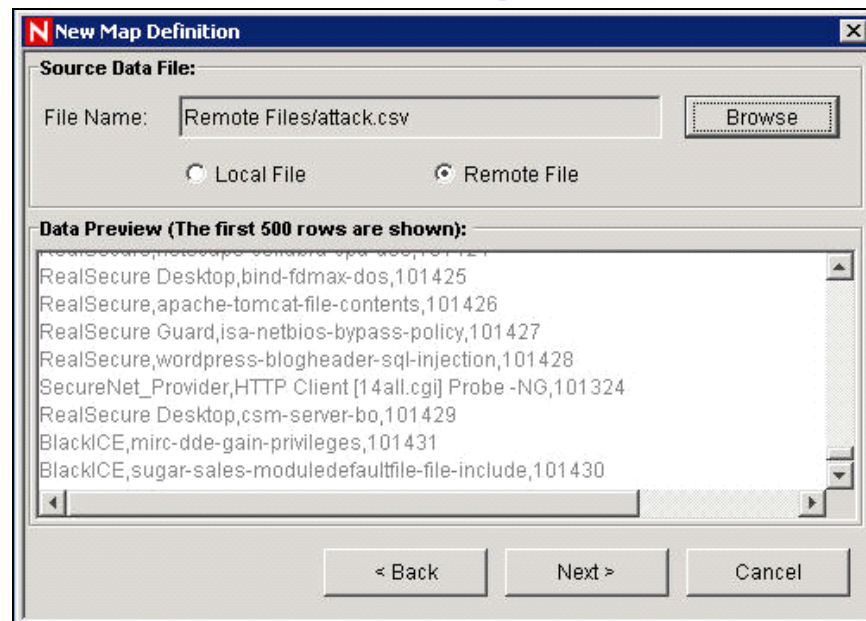
1. Navigate to Admin tab and select *Mapping Configuration* from the navigation pane or click *Mapping Configuration* button.
2. Click *Add*.
3. If you are creating a new map folder, click *New Dir*. Enter a folder name.

NOTE: If this is your first map definition, it is recommended that you create a new map definition folder. Creating a map definition under the *UNMANAGED ITEMS* folder will not allow you to edit or delete your map definition.

4. Ensure that the folder you want to enter your map definition into is selected. (that is, the folder indicates that it is open).
5. Enter 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 SDM was launched from).
 - **Remote File:** Allows you to choose from existing map source data files on the server where DAS is running. Seven files that may already exist on the server (if Advisor is installed and Vulnerability data was uploaded) are Asset, AssetToRegulation.csv, IpToCountry.csv, taxonomy.csv, CustomerToHierarchy.csv, attackNormalization.csv and exploitDetection.csv. 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: For map files that contain more than 500 lines, you will not see all the lines in the SDM.

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 may 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 would be 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 non-key columns that are active can be select as the *Map Column* under the Events 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.

New Map Definition

Column Definition:

Delimiters:

☒ Comma ☐ Pipe

☐ Tab ☐ Semicolon

☐ Other:

Start at row:

The first 500 rows are shown

	Column 1	Column 2	Column 3
Name:	IDS Mfr Name	Mfr Attack Name	Attack ID
Type:	String	String	String
Key:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Active:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Row 0	RealSecure Desktop	oracle-dbmssystem-bo	101001
Row 1	RealSecure Guard	openssl-asn1-parser-dos	101003
Row 2	BlackICE	merak-icewarp-file-dele...	101002

Column Filtering

< Back Finish Cancel

9. Once you finish configuring all parameters and filters for the definition, click *Finish*.
10. If you chose 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. Enter a file name and click *OK*.

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
```

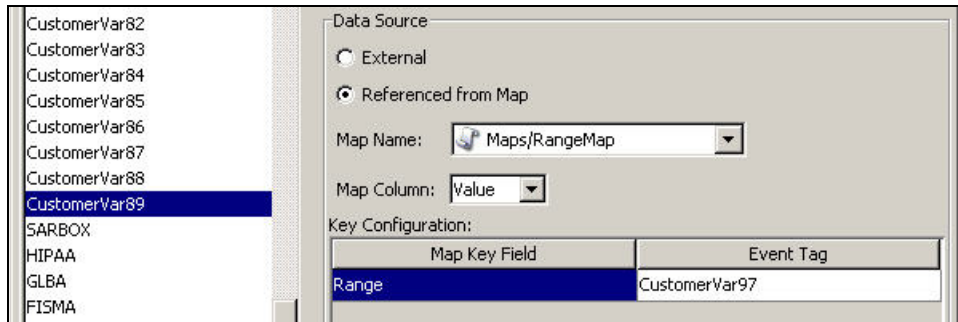
The first 500 rows are shown

	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:

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 may look like:



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:

- DestinationIP (dip)
- SourceIP (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 [Collector and Sentinel Meta-tags in Sentinel 6.0 User's 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 DestinationIP and key column set to column 1 (range)
- Map Column to column 2 (value). The output values for CustomerVar89.

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

CustomerVar87	Data Source <input type="radio"/> External <input checked="" type="radio"/> Referenced from Map Map Name: <input type="text" value="Maps/e-Security/qwerty"/> Map Column: <input type="text" value="value"/> Key Configuration: <table> <tr> <th>Map Key Field</th> <th>Event Tag</th> </tr> <tr> <td>range</td> <td>DestinationIP</td> </tr> </table>	Map Key Field	Event Tag	range	DestinationIP
Map Key Field		Event Tag			
range		DestinationIP			
CustomerVar88					
CustomerVar89					
SARBOX					
HIPAA					
GLBA					
FISMA					
NISPOM					
SIPCountry					
DIPCountry					
CustomerVar97					

If an event contains a destination IP of 10.0.1.14 (equivalent to numerical value of 167772430), the output for column CustomerVar89 within the event would 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).

Editing Map Definitions

To edit a map definition:

1. Navigate to Admin tab and select *Mapping Configuration* from the navigation pane or click *Mapping 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.

Edit Map Definition

Column Definition:

Delimiters:

☒ Comma ☐ Pipe
☐ Tab ☐ Semicolon
☐ Other:

Start at row:

The first 500 rows are shown

	Column 1	Column 2	Column 3
Name:	Device	AttackSignature	NormalizedAttackId
Type:	String	String	Number
Key:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Active:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Row 0	RealSecure Desktop	mozilla-netscape-nonas...	101000
Row 1	RealSecure Desktop	oracle-dbmssystem-bo	101001

Column Filtering

OK Cancel

The edit function allows you to:

- set your delimiters
- set which row to start your map
- rename your columns
- activate or deactivate a column
- set your column keys
- column filter

4. After making your changes, Click *OK*.

Deleting Map Definitions

To delete a map definition:

1. Navigate to Admin tab and select *Mapping Configuration* from the navigation pane or click *Mapping Configuration* button.
2. Expand the folder of interest.
3. Highlight the map definition to be deleted.
4. Click *Delete*.

NOTE: Map definitions under the *UNMANAGED ITEMS* folder cannot be deleted.

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.

To update map data:

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:

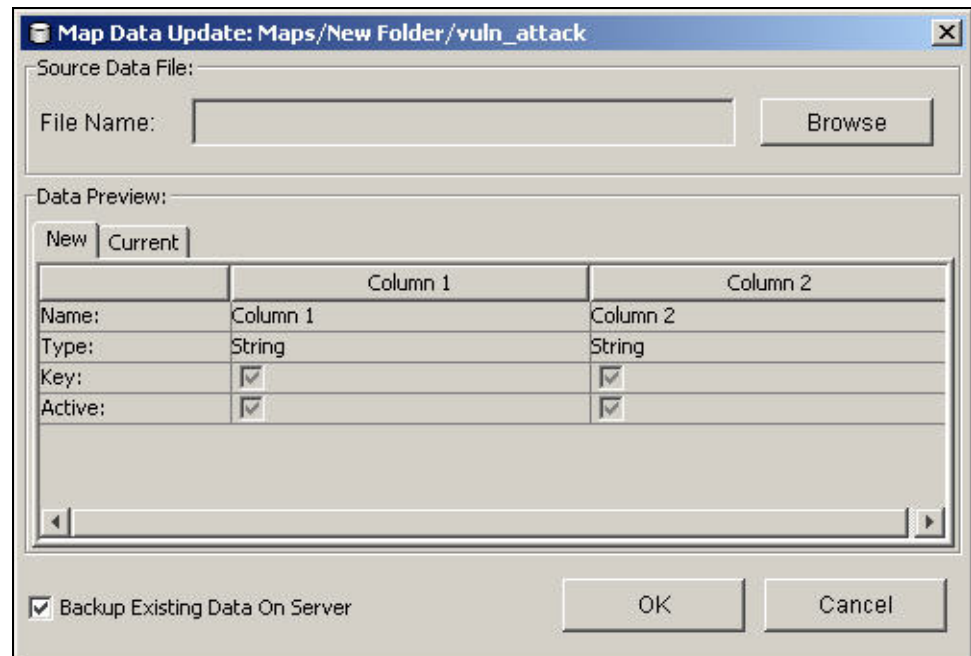
For Windows:

%ESEC_HOME%\data\map_data

For UNIX

\$ESEC_HOME/data/map_data

2. Navigate to Admin tab and select *Mapping Configuration* from the navigation pane or click *Mapping 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 will appear 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).

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.

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 the “**Mapping Tab**”. 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.

Since 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.

Map Key Field	Event Tag
PhysicalAssetName	SourceIP

In the above illustration, the SourceAssetName tag is populated from the map called Asset (which has asset.csv as its map data source file). The specific value for SourceAssetName is taken from the AssetName column from the Asset map. The PhysicalAssetName column is set as the key. When the SourceIP 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 IP 198.168.1.100 corresponds to AssetName Finance35.

NOTE: When a column is set as a key, it will not appear in the Column drop down field.

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

Key

SourceAssetName

You may 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:

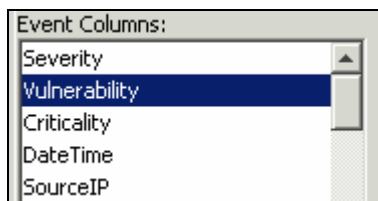
Map Key Field	Event Tag
Device	DeviceName
AttackSignature	DeviceAttackName

Key	Key	AttackId entry
Device	AttackSignature	NormalizedAttackId
Secure	BackDoorProbe (TCP 1234)	3 Trojan: Backdoor.SubSeven
Secure	BackDoorProbe (TCP 1999)	3 Trojan: Backdoor.SubSeven
Dragon	RWALLD:SYLOG-FORMAT	4 Sun Microsystems Solaris rwall Elevated P
Snort	RPC TCP rwall request	4 Sun Microsystems Solaris rwall Elevated P
Snort	RPC UDP rwall request	4 Sun Microsystems Solaris rwall Elevated P
Snort	WEB-IIS foxweb.dll access	12 Microsoft Exchange Server Arbitrary Code
RealSecure	SMTP_Exchange_Verb_DoS	12 Microsoft Exchange Server Arbitrary Code

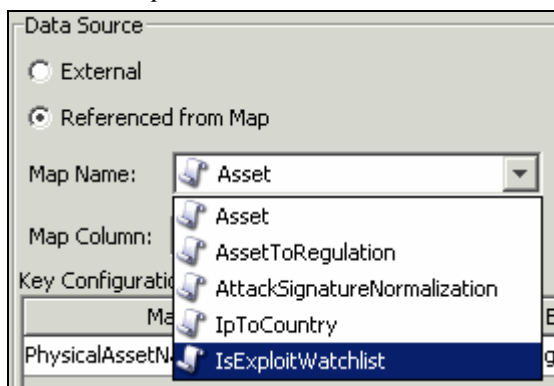
To Configure Event tags (columns) to use Mapping:

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 appears 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.

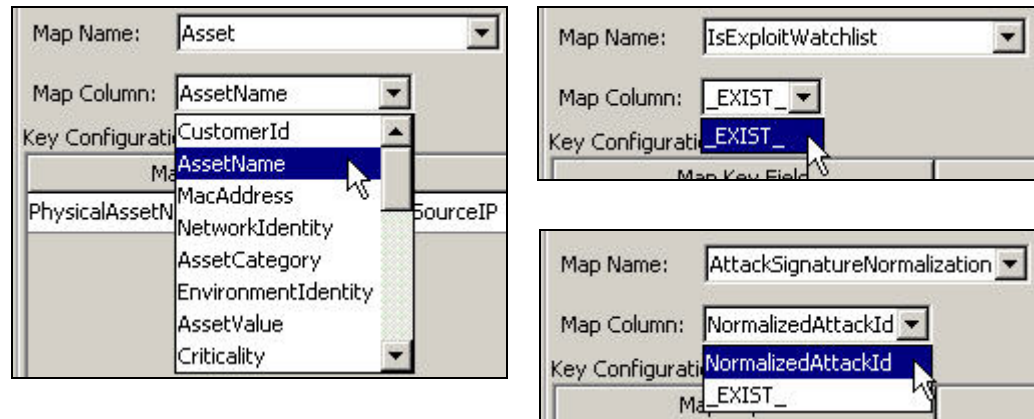


Select one of the following default maps or a map you have created:

- **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.
- **AssetToRegulation:** Contains the data from the map data source file AssetToRegulation.csv. This file must be populated manually.
- **AttackSignatureNormalization:** Contains the data from the map data source file attackNormalization.csv (IDS signatures). The attackNormalization.csv

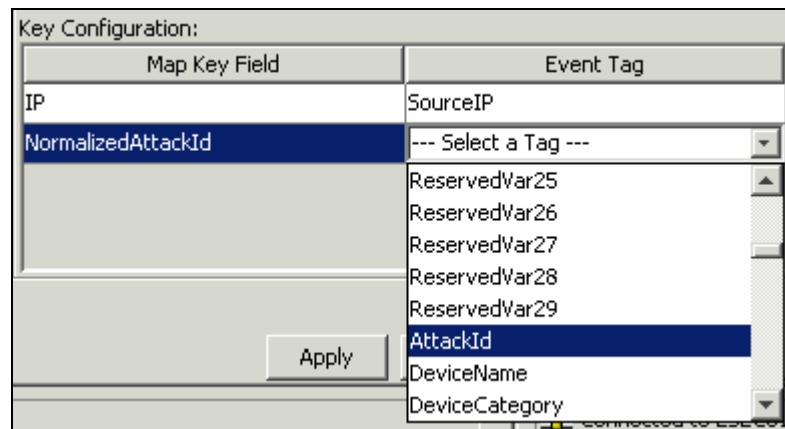
file is automatically generated from Advisor data from Sentinel Database when an Advisor feed is completed.

- **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.
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.



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 would like 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*.

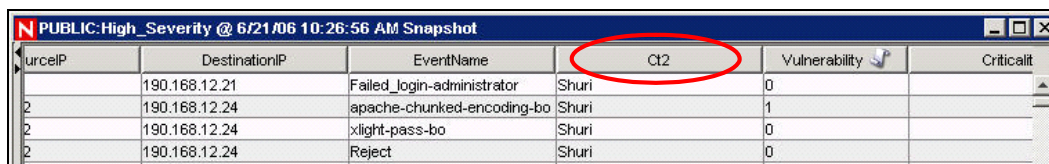
NOTE: Clicking *Save* will save your changes to the server. The save function saves all changes stored in the temporary buffer (when you clicked *Apply*).

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.

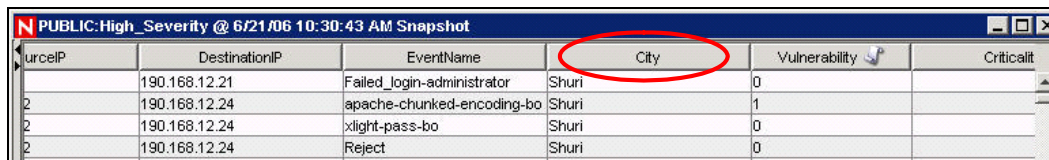
Renaming Tags does not change the name of the variable in Collector scripts, however. Therefore, even if the event tag labeled Ct2 is renamed to City, the variable that must be used in a Collector script to reference this meta-tag will still be s_CT2.

Below is a before and after illustration of this feature in an Active View.



Public:High_Severity @ 6/21/06 10:26:56 AM Snapshot

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	



Public:High_Severity @ 6/21/06 10:30:43 AM Snapshot

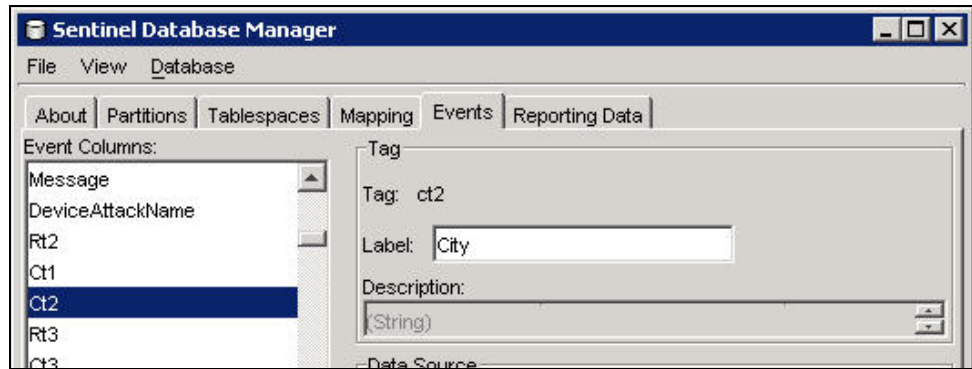
SourceIP	DestinationIP	EventName	City	Vulnerability	Criticality
	190.168.12.21	Failed_login-administrator	Shuri	0	
2	190.168.12.24	apache-chunked-encoding-bo	Shuri	1	
2	190.168.12.24	xlight-pass-bo	Shuri	0	
2	190.168.12.24	Reject	Shuri	0	

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 appears above the Label field. In addition, the description of the event column is provided.

2. Highlight an event column entry.
3. Enter 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.

Reporting Data

NOTE: In order to use Reporting Data, 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 *Reporting Data* tab is a *Summary Management Interface* for Sentinel. This tab allows you to enable and disable **Summaries**. Enabling a summary allows aggregation to start computing the counts for that particular summary.

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. For more information, see [Crystal Reports for Windows and Crystal Reports for Linux in the Sentinel 6.0 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.

Reporting Data 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.

▪ Summary Name	▪ Table/Description
▪ EventSrcSummary	<ul style="list-style-type: none">▪ 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	<ul style="list-style-type: none">▪ 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	<ul style="list-style-type: none">▪ EVT_DEST_TXNMY_SMRY_1▪ This summary sums the event count by destination ip, destion asset information, taxonomy, severity and event time by hour.
▪ EventSevDestEvtSummary	<ul style="list-style-type: none">▪ 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	<ul style="list-style-type: none">▪ EVT_PORT_SMRY_1▪ This summary sums the event count by destination port, severity and event time by hour.
▪ EventSevSummary	<ul style="list-style-type: none">▪ EVT_SEV_SMRY_1▪ This summary sums the event count by severity and event time by hour.

To disable/enable Summary:

1. Click *Reporting Data* in the navigation pane or click *Reporting Data* 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
FormedEvent	InActive
FormedEvent	InActive
FormedEvent	InActive
FormedEvent	InActive
FormedEvent	InActive

To enable *Aggregation for Top 10 reports* for Crystal Reports:

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 have to set the property "Status" to ON for EventFileRedirect in das_binary.xml

To view information for a Summary:

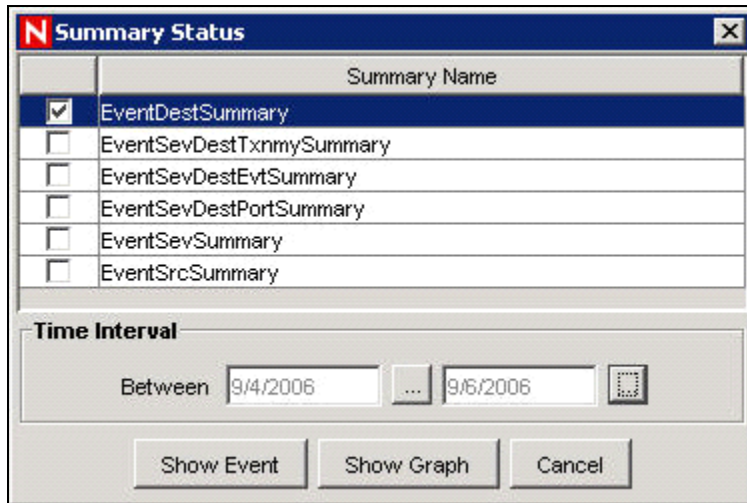
1. Click *Reporting Data* in the navigation pane or click the *Reporting Data* button.
2. Click on the "... " button in the Attributes column to see the attributes that makes up a summary.

Attributes	
IME.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

To check the Validity of a summary:

1. Click *Reporting Data* in the navigation pane or click the *Reporting Data* button.
2. Select *Status*.
3. Choose the summary or summaries you wish to query.

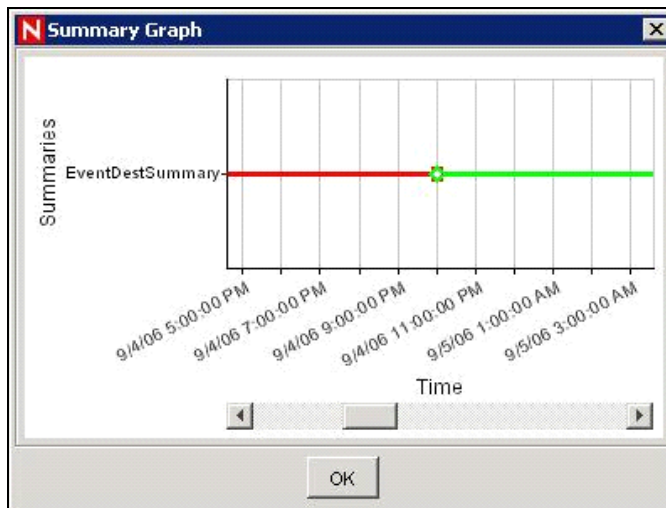


The **Summary Status** dialog box contains a table with the following data:

	Summary Name
<input checked="" type="checkbox"/>	EventDestSummary
<input type="checkbox"/>	EventSevDestTxnmySummary
<input type="checkbox"/>	EventSevDestEvtSummary
<input type="checkbox"/>	EventSevDestPortSummary
<input type="checkbox"/>	EventSevSummary
<input type="checkbox"/>	EventSrcSummary

Below the table is a **Time Interval** section with the text "Between" followed by two date input fields: "9/4/2006" and "9/6/2006", separated by an ellipsis button. At the bottom are three buttons: "Show Event", "Show Graph", and "Cancel".

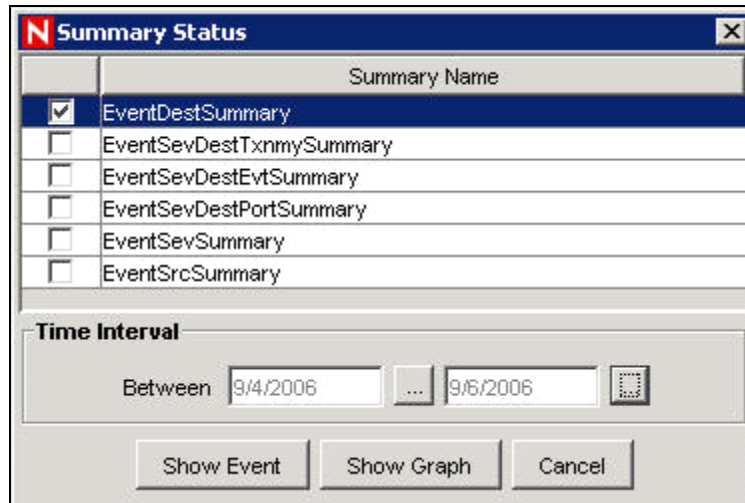
4. Select a time interval.
5. Click *Show Graph*.
6. The green bars signify that the summary is complete for that time frame. The red sections signify that the summary is missing data during that time period.



NOTE: To complete summaries, see [“Run EventFiles for a Summary”](#) section.

To query the Eventfiles for a summary:

1. Click *Reporting Data* in the navigation pane or click the *Reporting Data* button.
2. Select *Status*.
3. Choose the summary or summaries you wish to query.



Summary Status

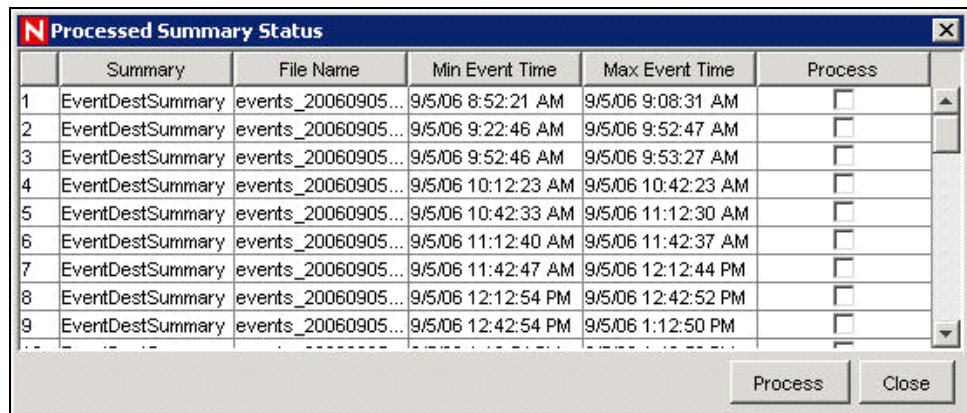
Summary Name	
<input checked="" type="checkbox"/>	EventDestSummary
<input type="checkbox"/>	EventSevDestTxnmySummary
<input type="checkbox"/>	EventSevDestEvtSummary
<input type="checkbox"/>	EventSevDestPortSummary
<input type="checkbox"/>	EventSevSummary
<input type="checkbox"/>	EventSrcSummary

Time Interval

Between ...

4. Select a time interval.
5. Click *Show Event*.
6. The Eventfiles needed to complete the summary display in a list format.

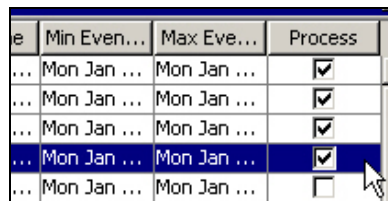
NOTE: To complete summaries, see **“Run EventFiles for a Summary”** section.



	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 *Reporting Data* in the navigation pane or click the *Reporting Data* button.
2. Select *Status*.
3. Choose the *Summary* or *Summaries* you wish to query.
4. Select a time interval.
5. Click *Show Event*.
6. The *Eventfiles* needed to complete the summary display in a list format.
7. Check the *Eventfiles* that you would like to run so that the summary is complete.



	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*.

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”
- “Modify a User Account”
- “View Details of a User Account”
- “Clone a User Account”
- “Delete a User Account”
- “Terminating an Active Session”
- “Add a iTRAC Role”
- “Delete iTRAC Role”
- “Viewing details of an iTRAC Role”

The installer will create the following default users on the Sentinel Server:

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.

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

Opening the User Manager Window

To open the User Manager window:

1. Click the *Admin* tab.
2. Click *Admin > User Configuration*.

Creating a User Account

NOTE: In order to meet stringent security configurations required by Common Criteria Certification, Sentinel requires a strong password with the following characteristics:

1. Choose passwords of at least 8 with characters in length that includes at least one UPPER CASE, one lower case, one special symbol (!@#\$\$%^&*()_+), and one numeric (0-9).
 2. Your password may not contain your e-mail name or any part of your full name.
 3. Your password should not be a "common" word (for example, it should not be a word in the dictionary or slang in common use).
-

-
4. 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.
 5. You should choose a password you can remember and yet is 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 permission User Management. User permissions are fairly detailed. For more information, see [Sentinel Database Users, Roles and Access Permissions in Sentinel 6.0 User's Reference Guide](#).

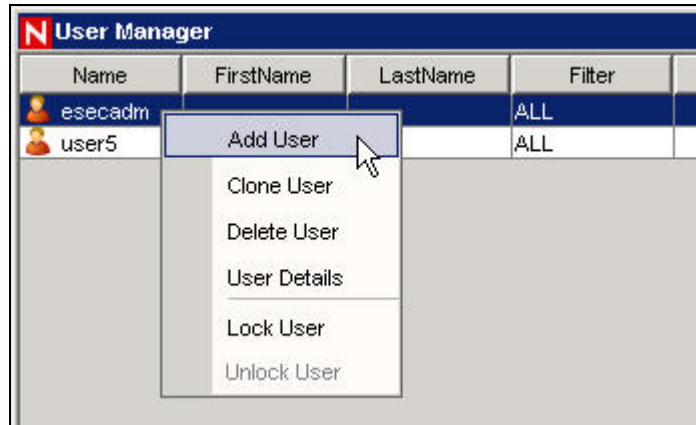
NOTE: The Sentinel Database Administrator, Sentinel Administrator, Sentinel Application User, and Sentinel Report User are created during installation. For more information about these users, see [Sentinel User Accounts in Sentinel 6.0 User's Reference Guide](#).

To create a user account:

1. Open the User Manager window.
2. Click *Add a new User*,



or high-light any user, right-click > *Add User*.



3. Under Authorization, enter:
 - User Name
 - Password
 - Confirm Password
 - Security Filter - To select a filter, click in the down arrow. The Filter Selection window opens. Highlight a filter or click *Add* to create a filter for this user account.

NOTE: After assigning a security filter to a user, you cannot delete that filter.

- Click *Select*
-

NOTE: It is strongly encouraged as a best practice a minimum password length of 8 characters that includes alphanumerics.

(Optional) Under Details, enter:

- First Name
 - Last Name
 - Department
 - Phone
 - Email
4. Click the *Permissions* tab and assign user permissions.
 5. Click the *Roles* tab and select the role for the user.
 6. 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.

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 User Accounts in Sentinel 6.0 User's Reference Guide](#).

To modify a user account:

1. Open the User Manager window.
2. Double-click on a user account or right-click > *User Details*.
3. Modify the account.
4. Click *OK*.

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 on a user account or right-click > *User Details*.
3. Review the details of the user account and close the window.

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*.
3. Change the user information and the user permissions.
4. Click *Save*.

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 will display. Click *Yes* to Delete the User.

Terminating an Active Session

To terminate an active session:

1. Open the Active User Sessions window.
2. Highlight an active session you wish to terminate.
3. Right click > *Kill Session*.
4. 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.

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*.

Deleting an iTRAC Role

To delete an iTRAC Role:

1. Open the Role Manager window.
2. Select a role, right-click > *Delete Role*.

Viewing Details of a Role

To view role details:

1. Open the Role Manager window.
2. Select a role, right-click > *Role Details*.

11

Sentinel Data Manager

Topics included in this chapter:

<u>Topic</u>	<u>Page</u>
Understanding Sentinel Data Manager	11-1
Starting the SDM GUI	11-1
SDM Command Line	11-8

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.

Starting the SDM GUI

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. This file, typically called ojdbc14.jar, will be installed by default on the machine that hosts the Sentinel DAS component.
- 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. Enter the following command line:

./sdm

To start SDM GUI on Windows:

1. Click *Start > All Programs (Win XP) or Program Files (Win 2000) > Sentinel > Sentinel Data Manager*.

NOTE: To run the SDM from the command line, see the “**SDM Command Line**” section in this document.

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 choose 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:



The screenshot shows a Windows-style dialog box titled "Connect to Database". It contains the following fields and controls:

- A key icon next to a "Server" dropdown menu set to "Oracle".
- Three input fields: "Database" (containing "ESEC"), "Host" (containing "my_database"), and "Port" (containing "1521").
- Two input fields: "Username" (containing "esecdba") and "Password" (empty).
- A checkbox labeled "Save connection settings" which is checked.
- A "Connect" button at the bottom right.

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..

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 would like to see.

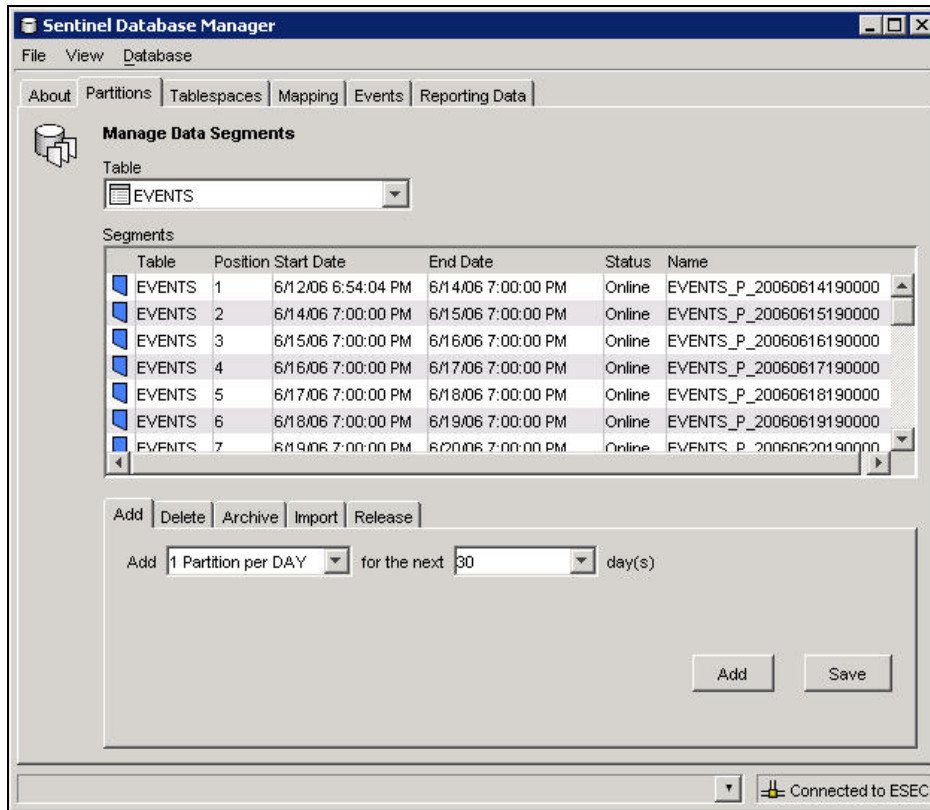
SDM displays the partitions of the currently selected Database Table.

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:

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 would like 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*.

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.

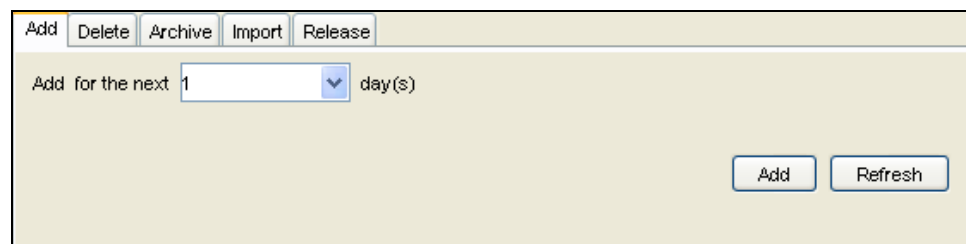
To archive partitions:

1. Select the *Archive* partitions tab.
2. Specify the number of days for which older partitions will be archived.

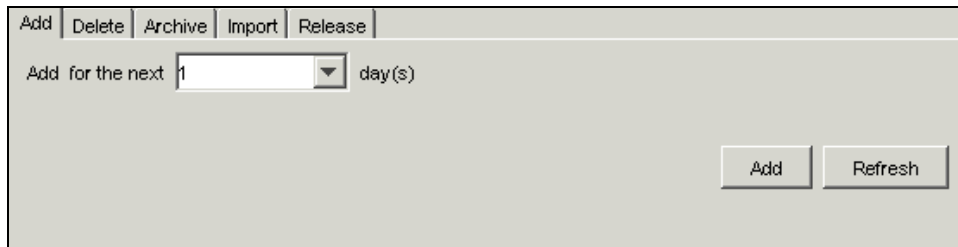
NOTE: You can specify the archive directory in the “Archive Destination” field in Partition configuration tab in SDM GUI.

3. Click *Archive*.

Oracle Archive Partitions Tab:



Microsoft SQL Archive Partitions Tab:

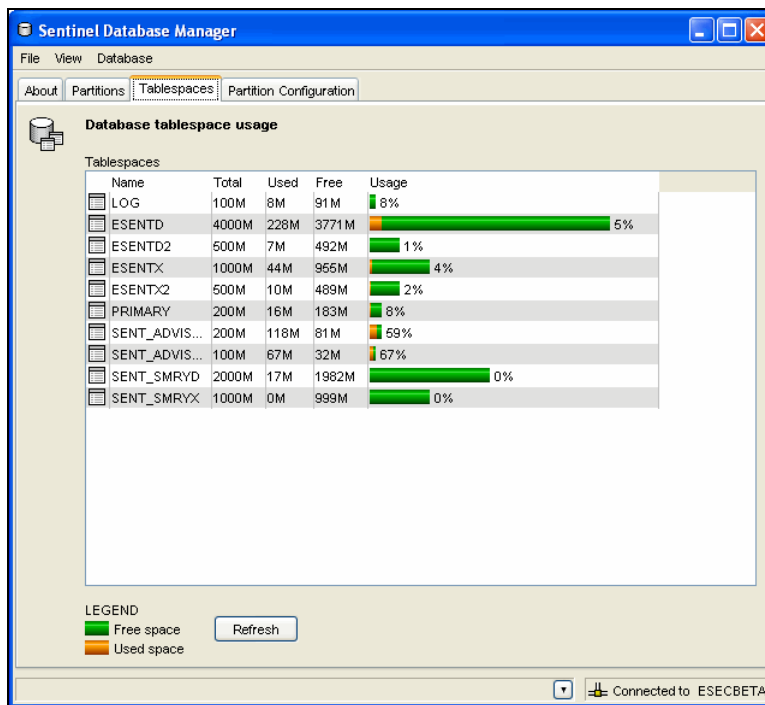


Tablespaces Tab

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.

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.

The screenshot shows the 'Partition Configuration' window in Sentinel Database Manager. The 'Table Group' is set to 'EVENT_SMRY'. Under 'Partition Configuration', the 'Partition Interval' is 8, 'Days Online' is 30, and the 'Archive destination' is '/Archive'. The 'Offline Operation' section has both 'archive' and 'drop' options checked. The 'Job Schedule' section has 'Jobs Enabled' unchecked, and there are fields for adding partitions and offline operations with HH24:MM time pickers. The 'Job Properties' section has 'Add Min' set to 7, 'Add Max' set to 14, and 'Archive Chunk' set to 3. A 'SAVE' button is located at the bottom of the configuration area. The status bar at the bottom indicates 'Properties have been updated successfully' and 'Connected to ESECFB7'.

2. Select the table group from the drop-down list.
3. Enter the following partition configuration information:
 - **Partition Interval:** Specify the number of partitions that should be created 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:** Choose archive and/or drop the data.

NOTE: Data that is dropped without archiving cannot be retrieved using SDM. You should almost always choose the *archive* option.

4. Specify the Job Schedule parameters:
 - Check *Jobs Enabled* checkbox if its not selected. By default the *Jobs Enabled* checkbox will be checked if you have selected this feature during installation.
 - Schedule adding partitions and offline operation parameters. Click *Save*.
 - Click *History* to view the Job History.
5. Enter 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 would 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*.

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.

- “General Syntax”
- “Start SDM GUI”
- “Save Connection Properties”
- “Add Partitions”
- “Drop Partitions”
- “View Partitions”
- “Archive Data”
- “Delete Data”
- “Listing Files to Import”
- “Import Data”
- “Delete Import Data”
- “Viewing Sentinel Database Space Usage”
- “Update Map Data”

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.

Starting SDM GUI

```
startGui (DEFAULT)
-action startGui [-connectFile <filePath>]
```

Saving Connection Properties for Sentinel Data Manager

The saveConnection command saves the database connection details to a specified file. These connection details are necessary for all other SDM command line operations.

If you have run the SDM GUI with “Save connection settings” selected, the saveConnection command is not necessary. You can use the sdm.connect file located in %ESEC_HOME%\sdm for Windows or \$ESEC_HOME/sdm for UNIX.

The saveConnection command uses the following flags:

```
-action      saveConnection
-server      <oracle or mssql2005>
-host        <database host IP Address or host name to connect to>
```

-port	<database port number to connect to [Oracle default: 1521/SQL Server default: 1433]>
-database	<database name/SID>
-driverProps	<Properties File>
-dbuser	<database username>
-password	<database password>
-winAuth	Used for Windows authentication. When using this option, -user and -password are not needed.
-connectFile	<filenameToSaveConnection>

The application saves all the above connection details along with the encrypted password to the sdm.connect file. All other SDM command line commands will refer to the specified file. This step should be completed first time you use the SDM command line on a machine and every time you want to change the connection details the application uses.

To run saveConnection:

1. Execute the command as follows:

```
-action saveConnection -server <oracle/mssql2005> -
host <hostIpAddress/hostname> -port <portnum> -
database <databaseName/SID> [-driverProps
<propertiesFile>] {-user <dbUser> -password <dbPass>
| -winAuth} -connectFile <filenameToSaveConnection>
```

The following example will save connections for a host with an IP address of 172.16.0.36 at port 1521 (default for Oracle, for SQL Server, default is 1433).

- Oracle Example:

```
./sdm -action saveConnection -server oracle -host
172.68.0.47 -port 1521 -database esec -user esecdba
-password XXXXXX -connectFile sdm.connect
```

- SQL Server Example (using SQL Server Authentication)

```
sdm -action saveConnection -server mssql -host
172.16.0.36 -port 1433 -database esec -user esecdba
-password XXXXXX -connectFile sdm.connect
```

- SQL Server Example (Windows Authentication):

```
sdm -action saveConnection -server mssql -host
172.16.0.36 -port 1433 -database esec -winAuth -
connectFile sdm.connect
```

This will save the connection details to the sdm.connect file. All the rest of the commands will take this filename as input to connect to the designated database and to perform their actions.

Adding Partitions

This action (addPartitions) adds the required number of partitions in the following tables according to the partition configuration settings:

- Oracle:
 - EVENTS
 - CORRELATED_EVENTS
 - EVT_DEST_EVT_NAME_SMRY_1
 - EVT_DEST_SMRY_1
 - EVT_DEST_TXNMY_SMRY_1

- EVT_PORT_SMRY_1
 - EVT_SEV_SMRY_1
 - EVT_SRC_SMRY_1
- SQL Server
 - EVENTS
 - CORRELATED_EVENTS
 - EVT_DEST_EVT_NAME_SMRY_1
 - EVT_DEST_SMRY_1
 - EVT_DEST_TXNMY_SMRY_1
 - EVT_PORT_SMRY_1
 - EVT_SEV_SMRY_1
 - EVT_SRC_SMRY_1

NOTE: Partitions are added in database both for Events and Correlated events if you select any one of these two. Partitions will be added for all the summary tables if you select any one of them.

If you are configured to have 10 days worth of partitions, every time you run *addPartitions* it checks to see if you have 10 days of partitions ahead. If you have enough partitions for next 10 days it will not do anything. If not, it will add the required number of partitions for 10 days.

This action uses the following flags:

```
-action      addPartitions
-connectFile <filePath>
-tableName   <table name>
-keepDays    <days to add>
```

To run addPartitions:

Execute this command as follows:

```
-action addPartitions -connectFile <filePath> -
tableName <table name> -keepDays <days to add>
```

- Oracle Example:

```
./sdm -action addPartitions -connectFile
sdm.connect -tableName EVENTS -keepDays 10
```

- SQL Server Example:

```
sdm -action addPartitions -connectFile sdm.connect
-tableName EVENTS -keepDays 10
```

Dropping Partitions

This action (dropPartition) drops all the partitions older than the flag keepDays from the following tables:

- Oracle:
 - EVENTS
 - CORRELATED_EVENTS
 - EVT_DEST_EVT_NAME_SMRY_1
 - EVT_DEST_SMRY_1
 - EVT_DEST_TXNMY_SMRY_1
 - EVT_PORT_SMRY_1
 - EVT_SEV_SMRY_1
 - EVT_SRC_SMRY_1

- SQL Server
 - EVENTS
 - CORRELATED_EVENTS
 - EVT_DEST_EVT_NAME_SMRY_1
 - EVT_DEST_SMRY_1
 - EVT_DEST_TXNMY_SMRY_1
 - EVT_PORT_SMRY_1
 - EVT_SEV_SMRY_1
 - EVT_SRC_SMRY_1

To prevent unintentional loss of data, this action does not drop any partitions that are not archived. If you want to delete unarchived partitions, use the *forceDelete* flag.

Caution: If -forceDelete is used, the deleted data cannot be recovered, so use this option with caution.

This action uses the following flags:

-action	dropPartitions
-keepDays	<number of days to keep>
-forceDelete	<either “true” or “false”>
(optional)	This defaults to false if not specified, meaning that only the partitions that are older than keepDays and are already archived will be dropped.
	If set to true, all partitions older than keepDays will be dropped, even if they have not been archived.
-connectFile	<filePath>
-tableName	<table name>

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 specified by the -tableName parameter, the dropPartition operation is applied to all tables in that group.

To run dropPartition:

Execute this command as follows:

```
-action dropPartitions -keepDays
<numberOfDaysToKeep> -tableName <table name> [-
forceDelete <true/false>] -connectFile <filePath>
```

The following examples drops all the partitions older than 30 days making sure all the partitions are archived. All partitions that were skipped (not removed) because they have not been archived are listed when the operation completes.

- Oracle Example:

```
./sdm -action dropPartitions -keepDays 30 -
tableName CORRELATED_EVENTS -forceDelete false -
connectFile sdm.connect
```

- SQL Example:

```
sdm -action dropPartitions -keepDays 30 -tableName
CORRELATED_EVENTS -forceDelete false -connectFile
sdm.connect
```

Viewing Partition Summaries

This action (ViewPartitions) displays the partition summary of the following supported tables:

- Oracle:
 - EVENTS
 - CORRELATED_EVENTS
 - EVT_DEST_EVT_NAME_SMRY_1
 - EVT_DEST_SMRY_1
 - EVT_DEST_TXNMY_SMRY_1
 - EVT_PORT_SMRY_1
 - EVT_SEV_SMRY_1
 - EVT_SRC_SMRY_1
- SQL Server
 - EVENTS
 - CORRELATED_EVENTS
 - EVT_DEST_EVT_NAME_SMRY_1
 - EVT_DEST_SMRY_1
 - EVT_DEST_TXNMY_SMRY_1
 - EVT_PORT_SMRY_1
 - EVT_SEV_SMRY_1
 - EVT_SRC_SMRY_1

NOTE: You need to have SDM installed in order to view the partition summary.

This command uses the following flags:

```
-action      viewPartitions
-tableName   <table name>
-connectFile <filePath>
```

To View Partition Summaries:

Execute this command as follows:

```
-action viewPartitions -tableName <table name> -
connectFile <filePath>
```

The following example, displays the list of partitions of the EVENTS table and status of each partition.

- Oracle Example:


```
./sdm -action viewPartitions -tableName EVENTS -
connectFile sdm.connect
```
- SQL Server Example:


```
sdm -action viewPartitions -tableName EVENTS -
connectFile sdm.connect
```

Archiving Data

Run this action (archiveData) after you set your archive configuration (this can be configured in Partition Configuration tab in SDM GUI). This action archives the data from the given table name according to the archive configuration. It archives data from:

- Oracle:
 - EVENTS
 - CORRELATED_EVENTS
- SQL Server
 - EVENTS
 - CORRELATED_EVENTS

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 table in the group is specified by the `-tableName` parameter, the `archiveData` operation is applied to all tables in that table group.

This command uses the following flags:

```
-action      archiveData
-connectFile <filePath>
-tableName   <table name>
-keepDays    <numberOfDaysToKeep>
```

To run `archiveData`:

Execute this command as follows:

```
-action archiveData -connectFile <filePath> -
tableName <table name> -keepDays
<numberOfDaysToKeep>
```

The following examples archive events and correlated events from the EVENTS and CORRELATED_EVENTS tables according to the value set during archive configuration (using the `archiveConfig` command).

- Oracle Example:


```
./sdm -action archiveData -connectFile sdm.connect
-tableName EVENTS -keepDays 30
```
- SQL Server Example:


```
sdm -action archiveData -connectFile sdm.connect -
tableName EVENTS -keepDays 30
```

Deleting Data

This action (`deleteData`) deletes the data older than a specified number of days from the given table name. It deletes data from:

- Oracle:
 - EVENTS
 - CORRELATED_EVENTS
 - EVT_DEST_EVT_NAME_SMRY_1
 - EVT_DEST_SMRY_1
 - EVT_DEST_TXNMY_SMRY_1
 - EVT_PORT_SMRY_1
 - EVT_SEV_SMRY_1
 - EVT_SRC_SMRY_1
- SQL Server
 - EVENTS
 - CORRELATED_EVENTS

- EVT_DEST_EVT_NAME_SMRY_1
- EVT_DEST_SMRY_1
- EVT_DEST_TXNMY_SMRY_1
- EVT_PORT_SMRY_1
- EVT_SEV_SMRY_1
- EVT_SRC_SMRY_1

NOTE: This action does not drop any partitions that are not archived. If you want to delete unarchived partitions, the optional flag *forceDelete* has to be specified with a value of true.

If *forceDelete* is used:

false or not specified	drops only the partitions older than keepDays and those that are archived
true	drops all the partitions older than keepDays including unarchived partitions

This command uses the following flags:

-action	deleteData
-keepDays	<number of days to keep>
[-forceDelete]	<either true or false>
-connectFile	<filePath>
-tableName	<table name>

To run deleteData:

Execute this command as follows:

```
-action deleteData -keepDays <numberOfDaysToKeep>
[-forceDelete <true/false>] -connectFile <filePath>
-tableName <table name>
```

- Oracle Example:

The following example drops partitions from all tables older than 13 days making sure all dropped partitions are archived. In the end, a list is generated of any partitions that were not deleted if they have not been archived.

```
./sdm -action deleteData -keepDays 13 -forceDelete
false -connectFile sdm.connect -tableName EVENTS
```

- SQL Server Example:

The following example drops the partitions from all tables older than 13 days making sure all dropped partitions are archived. In the end, it lists any partitions that were not deleted if they have not been archived.

```
sdm -action deleteData -keepDays 13 -forceDelete
false -connectFile sdm.connect -tableName EVENTS
```

Listing Files to Import

This action (filesToImport) is used to list the files needed to import the data between the given dates into the following supported tables:

- SQL Server
 - HIST_EVENTS
 - HIST_CORRELATED_EVENTS

NOTE: The tables are imported in Oracle with the same name they are archived with.

If these files have been moved to another location since the original archiving operation (F, moved to tape), they must be restored to a directory accessible from the database server with their original file names.

This command uses the following flags:

-action	filesToImport
-tableName	<table name>
-startDate	<mm/dd/yyyy hh24:mi:ss>
-endDate	<mm/dd/yyyy hh24:mi:ss>
-connectFile	<filePath>

NOTE: hh24 is hours represented in 24 hour format. For example, 1:15:00 p.m. is 13:15:00 and 3:00:00 a.m. is 03:00:00.

To run filesToImport:

Execute this command as follows:

```
-action filesToImport -tableName <table name> -
startDate <mm/dd/yyyy hh24:mi:ss> -endDate
<mm/dd/yyyy hh24:mi:ss> -connectFile <filePath>
```

The following example lists all files containing data between dates “09/25/2007 00:00:00” (Sep 25th midnight) and “09/26/2007 00:00:00” (Sep 26th midnight) that have been previously archived.

- Oracle Example:

```
./sdm -action filesToImport -tableName Events -
startDate 09/25/2007 00:00:00 -endDate 09/26/2007
00:00:00 -connectFile sdm.connect
```

- SQL Server Example:

```
sdm -action filesToImport -tableName Events -
startDate 09/25/200\7 00:00:00 -endDate 09/26/2007
00:00:00 -connectFile sdm.connect
```

The following example lists all the files containing the data between dates “09/25/2007 16:00:00” (Sep 25th 4 PM) and “09/26/2007 18:00:00” (SEP 26, 6 PM) that has been archived earlier and can be imported back.

- Oracle Example:

```
./sdm -action filesToImport -tableName Events -
startDate 09/25/2007 16:00:00 -endDate 09/26/2007
18:00:00 -connectFile sdm.connect
```

- SQL Server Example:

```
sdm -action filesToImport -tableName Events -
startDate 09/25/2007 16:00:00 -endDate 09/26/2007
18:00:00 -connectFile sdm.connect
```

Importing Data

This action (importData) imports data between the given dates into the Sentinel database so it can be used for historical reporting or other purposes. The data is imported into the following tables:

- SQL Server
 - HIST_EVENTS
 - HIST_CORRELATED_EVENTS

NOTE: The tables are imported in Oracle with the same name they are archived with.

If the data has already been imported or there is no archived data is found between the specified dates, it returns a notification.

The application imports data from each file into a table and builds the historical view on all the historical tables. The report view joins on the original table and historical view. All Sentinel reports use the report view and thus will see any imported data.

This command uses the following flags:

```
-action      importData
-tableName   <table name>
-startDate   <mm/dd/yyyy hh24:mi:ss>
-endDate     <mm/dd/yyyy hh24:mi:ss>
-connectFile <filePath>
```

NOTE: hh24 is hours represented in 24 hour format. For example, 1:15:00 p.m. is 13:15:00 and 3:00:00 a.m. is 03:00:00.

NOTE: The files to be imported must exist in the directory with their original file names.

To run importData:

Place all the files you wish to import in a specific directory (that is, dirPath - <directory to import files from>) and execute the following command

```
-action importData -startDate <mm/dd/yyyy
hh24:mi:ss> -endDate <mm/dd/yyyy hh24:mi:ss> -
tableName <table name> -connectFile <filePath>
```

The following example imports the archived files from the tmp directory containing the data between dates “09/25/2007 00:00:00” (Sep 25 midnight) and “09/26/2007 00:00:00” (Sep 26 midnight).

- Oracle Example:


```
./sdm -action importData -startDate 09/25/2007
00:00:00 -endDate 09/26/2007 00:00:00 -tableName
Events -connectFile sdm.connect
```
- SQL Server Example:


```
sdm -action importData -dirPath c:\tmp -startDate
09/25/2007 00:00:00 -endDate 09/26/2007 00:00:00 -
tableName Events -connectFile sdm.connect
```

Deleting Imported Data

This action (dropImported) deletes the imported data between the given dates from the following supported tables:

- SQL Server
 - HIST_EVENTS
 - HIST_CORRELATED_EVENTS

NOTE: The tables are imported in Oracle with the same name they are archived with.

If there is no data imported between two specified dates, it returns a notification.

This command uses the following flags:

-action	dropImported
-startDate	<mm/dd/yyyy hh24:mi:ss>
-endDate	<mm/dd/yyyy hh24:mi:ss>
-tableName	<table name>
-connectFile	<filePath>

NOTE: hh24 is hours represented in 24 hour format. For example, 1:15:00 p.m. is 13:15:00 and 3:00:00 a.m. is 03:00:00.

To run dropImported:

Execute this command as follows:

```
-action dropImported -startDate <mm/dd/yyyy  
hh24:mi:ss> -endDate <mm/dd/yyyy hh24:mi:ss> -  
tableName <table name> -connectFile <filePath>
```

The following example deletes the imported data between the given dates from the above mentioned tables.

- Oracle Example:

```
./sdm -action dropImported -startDate 09/25/2007  
00:00:00 -endDate 09/26/2007 00:00:00 -tableName  
Events -connectFile sdm.connect
```

- SQL Server Example:

```
sdm -action dropImported -startDate 09/25/2007  
00:00:00 -endDate 09/26/2007 00:00:00 -tableName  
Events -connectFile sdm.connect
```

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:

-action	dbstats
-connectFile	<filePath>

To view Sentinel Database Space Usage (Command Line):

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
```

Update Map Data

This action 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.

This command uses the following flags:

-action	updateMapData
-map	<mapName>
-file	<fileName>
-backup	<true/false>
(Optional)	
-connectFile	<filePath>

To run updateMapData:

Execute this command as follows:

```
-action updateMapData -map <mapName> -file  
<fileName> [-backup <true/false> (DEFAULT: true)] -  
connectFile <filePath>
```

- Oracle Example:

```
./sdm -action updateMapData -map Maps/rMap -file  
D:\EDLocal_Updated.csv -connectFile D:\sdm.connect
```

- SQL Server Example:

```
sdm -action updateMapData -map Maps/rMap -file  
D:\EDLocal_Updated.csv -connectFile D:\sdm.connect
```

12 Utilities

Topics included in this chapter:

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Introduction to Sentinel Utilities

This chapter 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.

Starting and Stopping 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 may 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 may need to start or stop a Sentinel Server due to the following routine maintenance:

- Upgrades
- Patches
- Hotfixes

Starting a Sentinel Server

To start the UNIX Sentinel Server:

1. Log into the machine where the Sentinel Server you wish 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 on *Administrative Tools*.
3. Double-click on *Services*.
4. In the *Services* window, highlight *Sentinel*.
5. Right-click >*Start* or click *Start* in the tool bar.

Stopping a Sentinel Server

To stop the UNIX Sentinel Server:

1. Log into the machine where the Sentinel Server you wish 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 on *Administrative Tools*.
3. Double-click on *Services*.
4. In the *Services* window, highlight *Sentinel*.
5. Right-click >*Stop* or click *Stop* in the tool bar.

Sentinel Scripts

Depending upon which components are installed, the \$ESEC_HOME/bin (on UNIX) or %ESEC_HOME%\bin (on Windows) directory may 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.

Operational Scripts

The scripts below can be used during the normal operation of Sentinel.

Script File:	Description:
<ul style="list-style-type: none">adv_change_passwd.batadv_change_passwd.sh	Resets the encrypted Advisor password stored in the Advisor configuration files. For more information, see section Resetting Advisor password (Direct Download Only) of Advisor Configuration in <i>Sentinel 6.0 Installation Guide</i> .
<ul style="list-style-type: none">advisor.batadvisor.sh	Starts the Internet download and processing of Advisor feed data. This script is scheduled to run automatically when Advisor is installed.
<ul style="list-style-type: none">AnalyzePartitions.sh	Runs the analyze partitions action on the Sentinel Database. This script is only available for Sentinel Database running on Oracle. For more information, see section Analyze Partitions in the Supported Platforms and Best Practices in <i>Sentinel 6.0 Installation Guide</i> .
<ul style="list-style-type: none">BackupIncidentData.batBackupIncidentData.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=suplna v4_phonesup).
<ul style="list-style-type: none">control_center.batcontrol_center.sh	Launches the Sentinel Control Center graphical user interface.
<ul style="list-style-type: none">dbconfig.batdbconfig	Configures the database connection settings stored in the DAS container xml files. For more information, see section Reconfiguring Database Connection Properties of Sentinel Data Access Service in <i>Sentinel 6.0 Installation Guide</i> .
<ul style="list-style-type: none">dbHealthCheck.sh	Displays Sentinel Database health information. This script is only available for Sentinel Database running on Oracle. For more information, see section Database Health Check for Oracle in the Supported Platforms and Best Practices in <i>Sentinel 6.0 Installation Guide</i> .
<ul style="list-style-type: none">extconfig.batextconfig	Resets any of the encrypted 3 rd Party Integration passwords stored in the das_query.xml file. For more information, see either the section Resetting the Remedy Password in the Remedy Help Desk Operations or section Resetting the HP OpenView Passwords in HP OpenView Service Desk Integration , both of them are in the <i>3rd Party Integration Guide</i> .
<ul style="list-style-type: none">keymgr.batkeymgr.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 <i>Sentinel 6.0 Installation Guide</i> .
<ul style="list-style-type: none">mailconfig.bat	Configures and tests the configuration of SMTP e-mail

<ul style="list-style-type: none"> ▪ mailconfig.sh ▪ mailconfigtest.bat ▪ mailconfigtest.sh 	server settings. For more information, see “Configuring Sentinel E-mail” .
<ul style="list-style-type: none"> ▪ 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 <i>Sentinel 6.0 Installation Guide</i> .
<ul style="list-style-type: none"> ▪ sdm.bat ▪ sdm 	Launches the Sentinel Data Manager application. For more information, see Chapter 11, “Sentinel Data Manager” .
<ul style="list-style-type: none"> ▪ sentinel.sh ▪ sentinel.bat 	Starts or stops the Sentinel Server. For more information, see “Starting and Stopping Sentinel Server” .
<ul style="list-style-type: none"> ▪ softwarekey.bat ▪ softwarekey.sh 	Resets the Sentinel license key. For more information, see “Updating Your License Key” .
<ul style="list-style-type: none"> ▪ versionreader.bat ▪ versionreader.sh 	Displays the version information stored in a Sentinel jar file. For more information, see “Sentinel .jar Version Information” .

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. Starting and Stopping Sentinel Server

NOTE: These scripts should not be used during normal operation of Sentinel.

Script File:	Description:
<ul style="list-style-type: none"> ▪ collector_mgr.bat ▪ 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 	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.
<ul style="list-style-type: none"> ▪ event_file_info.bat 	Displays information about an event file that will be

▪ event_file_info	processed by DAS Aggregation.
▪ list_broker_connections.bat	Displays all of the active connections to the iSCALE message bus.
▪ list_broker_connections	
▪ runalert.bat	Starts the Internet download and processing of either the <i>alert</i> or <i>attack</i> Advisor feed data. The advisor.bat/.sh script will run both of these scripts during normal operation.
▪ runalert.sh	
▪ runattack.bat	
▪ runattack.sh	
▪ setadvenv.bat	Used by the Advisor scripts to set some local environment variables.
▪ setadvenv.sh	
▪ setenv.sh	Used by many of the Sentinel script to set some local environment variables.
▪ 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” .
▪ start_broker.sh	
▪ 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	Stops the message bus component of the Communication Server. For more information, see “Stopping the Communication Server in Console Mode” .
▪ stop_broker.sh	
▪ stop_container.bat	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 once it is stopped.. For more information, see “Restarting Sentinel Containers” .
▪ stop_container.sh	
▪ uninstallAt.bat	Removes the Advisor feed download and processing scheduled jobs. This script is run automatically by the uninstaller.
▪ uninstallcron.sh	

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 [“Starting a Sentinel Server”](#). 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 on (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. Enter:

```
./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 “**Stopping a Sentinel Server**”.

To stop the Communication Server (Windows):

1. Either go or navigate through Windows Explorer to:

```
%ESEC_HOME%\bin
```

2. Either double-click on (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. Enter:

```
./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.

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. Enter:
`.\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. Enter:
`./stop_container.sh <host machine> <process name>`
For example:
`./stop_container.sh localhost DAS_RT`

Version Information

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. Enter:
`./<process> -version`
For example:
`./agentengine -version`

To display Sentinel executable version information (Windows):

1. Go to:
`%ESEC_HOME%\bin`
2. Enter:

```
.\<process> -version
```

For example:

```
.\agentengine -version
```

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 on 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 will appear in the *Value* pane.

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, enter:

For UNIX:

```
./versionreader.sh <path/jar file name>
```

For Windows

```
.\versionreader.bat <path/jar file name>
```

Configuring Sentinel E-mail

Sentinel email configuration settings are stored in the *execution.properties* file during installation. This file can be edited after installation. This file is on the machine where DAS is installed and is located:

For Windows:

```
%ESEC_HOME%\config
```

For UNIX:

```
$ESEC_HOME/config
```

There are two scripts (*.sh for UNIX and *.bat for Windows) that change and test the email settings within the execution.properties file. The mailconfig.* script changes the email settings and the mailconfigtest.* script tests the email settings. The bolded areas are the email settings that can be changed.

The properties within execution.properties are:

mail.authentication.user=<domain\\user>

correlated events retry wait=5000

mail.smtp.host=<SMTP_HOST>

mail.events.max=1000

The SMTP host that will be used to send email.

Maximum number of events that will be sent in an email that is automatically triggered by the correlation engine. Its purpose is to limit the size of emails for correlated events that have a very large set of trigger events.

correlated events retry count=10

mail.address.from=<SMTP_FROM_ADDR>

The email address that appears in the From field of the email sent from DAS.

mail.authentication.password=<password>

password for mail.authentication.user.

The mailconfig.sh and mailconfig.bat scripts use the following arguments:

-host	SMTP host name or IP address
-from	From field of the email
-user	The mail authentication user
-password	Password for the mail authentication user

NOTE: Do not enter your password after the -password argument. You will be prompted for a new password after you enter the command. The console output will be masked by asterisks (*).

The mailconfigtest.sh and mailconfig.bat file use the following arguments:

-to	Destination email address
-----	---------------------------

To set email properties in the execution.properties file:

1. On the machine where you have DAS installed, go to:

For UNIX:

\$ESEC_HOME/bin

For Windows

%ESEC_HOME%\bin

2. Execute mailconfig as follows:

For UNIX:

```
./mailconfig.sh -host <SMTP Server> -from <source  
email address> -user <mail authentication user> -  
password
```

For Windows:

```
mailconfig.bat -host <SMTP Server> -from <source  
email address> -user <mail authentication user> -  
password
```

UNIX example:

```
./mailconfig.sh -host 10.0.1.14 -from  
my_name@domain.com -user my_user_name -password
```

Windows example:

```
mailconfig.bat -host 10.0.1.14 -from  
my_name@domain.com -user my_user_name -password
```

After entering this command you will be prompted for a new password.

```
Enter your password:*****
```

```
Confirm your password:*****
```

NOTE: When using the password option, it must be the last argument.

To test your email settings in the execution.properties file:

1. On the machine where you have DAS installed, go to:

For UNIX:

```
$ESEC_HOME/bin
```

For Windows

```
%ESEC_HOME%\bin
```

2. Execute mailconfigtest as follows:

For UNIX:

```
./mailconfigtest.sh -to <destination email address>
```

For Windows:

```
mailconfigtest.bat -to <destination email address>
```

If your mail is sent successfully, you will get the following on screen output and e-mail received at the destination address.

```
Email has been sent successfully!
```

Check the destination e-mail mailbox to confirm receipt of email. The subject line and content should be:

```
Subject: Testing e-security mail property
```

```
This is a test for e-security mail property set up.
```

```
If you see this message, your e-security mail  
property has been configured correctly to send  
emails
```

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. Enter the following command:

```
. /softwarekey.sh
```

4. Enter 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. Enter the following command:

```
.\softwarekey.bat
```

4. Enter the number 1 to set your primary key. Press enter.

13 Quick Start

Topics included in this chapter:

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Event Query	13-3
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Analysis Tab	13-14
Simple Correlation	13-15

Security Analysts

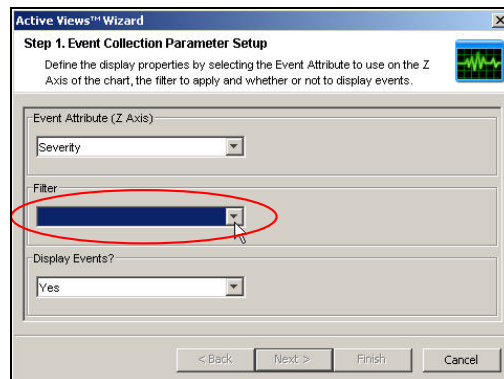
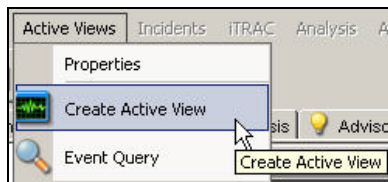
NOTE: This document assumes your Security Administrator has built the necessary filters and configured Collectors for your system.

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*.

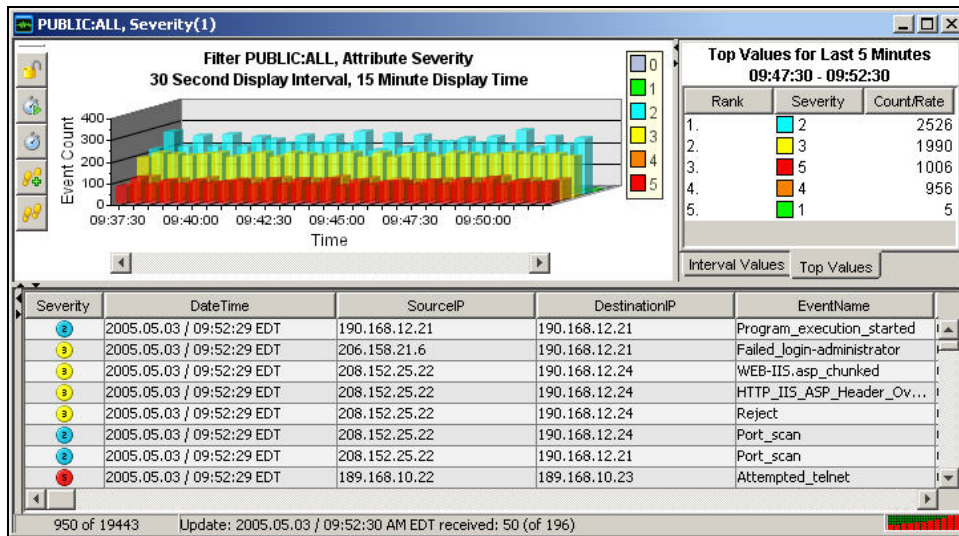


Owner	Filter Name	Expression String
PUBLIC	Operating_System_...	filter(e.DeviceCategory = "OS")
PUBLIC	Database_Events	filter(e.DeviceCategory = "DB")
PUBLIC	IDS_Events	filter(e.DeviceCategory = "IDS")
PUBLIC	High_Severity	filter(e.Severity >= 3)
PUBLIC	Firewall_Events	filter(e.DeviceCategory = "FW")
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 != "T") and (e.SensorType != "P"))
PUBLIC	ALL	filter(e.Severity >= 0)
PUBLIC	Scan_Events	filter(e.DeviceCategory = "SCAN")
PUBLIC	Severe_Internal	filter((e.SensorType = "T") and (e.Severity >= 3))
PUBLIC	wmi	filter(e.WizardPort = "wmi")
PUBLIC	Internal_Events	filter(e.SensorType = "T")

- Manage Filter Configuration

Add Clone Delete Details Select

3. Click *Finish*. If you have an active network, you may see something similar to:



NOTE: To display a 3-D graph without real time events, click the Display Events down arrow and select *No*.

Exploit Detection

To view any events indicating a possible exploitation, you must have the following:

- Advisor Feed
- Intrusion detection
- Vulnerability scanning

Severity	Vulnerability	AttackId
2	0	
3	0	

Within an event, the values in the vulnerability field convey the following:

- When the Vulnerability field equals 1, the asset or destination device is possibly exploited.
- When the vulnerability field equals 0, the asset or destination device is indicated as not being exploited..
- When the Vulnerability field is blank, the exploit detection feature of Sentinel is not enabled.

To view events that indicate a possible exploitation, create an Active View with a filter where Vulnerability equals 1. For example, if you have Nmap and have run the Nmap Collector, you can view asset information on the exploited asset or any asset.

For more information on how exploit detection works and which Intrusion Detection Systems and Vulnerability Scanners are supported, see [Chapter 1 “Sentinel Control Center”](#).

Asset Data

To view Asset information for any event, right-click on an event or events > *Analysis > Asset Data*, a window similar to the one below will appear.

Asset Report									
Hardware	MAC Address	04:23:A3:44:65:87							
	Name		Value	UNKNOWN					
	Type	DESKTOP	Criticality	UNKNOWN					
	Vendor	UNKNOWN	Sensitivity	UNKNOWN					
	Product		Environment	UNKNOWN					
	Version		Location	UNKNOWN					
Network	IP	Hostname							
	192.168.0.10 devbox10								
Software	Name	Type	Vendor	Product	Version				
Contacts	Order	Name	Role	Email	Phone Number				
		OwnerFirstName10 OwnerLastName10	ASSET_OWNER	OwnerEmail10	OwnerPhoneNumber10				
		MaintainerFirstName10	ASSET_MAINTAINER	MaintainerEmail10	MaintainerPhoneNumber10				
		MaintainerLastName10							
		BusinessUnit10	BUSINESS_UNIT						
		LineOfBusiness10	LINE_OF_BUSINESS						
		Division10	DIVISION						
		Department10	DEPARTMENT						
Location	Room	709							
	Rack	10							
	Address	HQ							
		1921 Gallows Rd Suite 700 Vienna VA 22182 USA							
Hardware	MAC Address	04:23:A3:44:65:78							
	Name		Value	AssetValue					
	Type	DESKTOP	Criticality	Criticality					
	Vendor	Vendor	Sensitivity	Sensitivity					
	Product	ProductName	Environment	EnvironmentIdentity					
	Version	ProductVersion	Location	NetworkIdentity					
Network	IP	Hostname							
	192.168.0.1								

Event Query

Example Scenario – Telnet Event:

During monitoring, you see numerous telnet attempts from source IP 189.168.10.22. 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 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: 189.168.10.22
- Destination IP: 189.168.10.23
- 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 will display. Click *Add*, enter a filter name of *telnet SIP 189_168_10_22*. In the field below the Filter, enter:
 - SourceIP = 189.168.10.22
 - EventName = Attempted_telnet
 - Severity = 5
 - SensorType = H
 - DestinationIP = 189.168.10.23
 - Match if, select *All conditions are met (and)*
3. Click *Save*. Highlight your filter and click *Select*.
4. Enter your time period of interest; click *Search* (magnifying glass icon). The results of your query will appear. If your Event Query makes a match, you will get a result similar to the following illustration.

Filter:	Severity:	<input type="checkbox"/> From:	<input type="checkbox"/> From:	<input type="checkbox"/> To:	<input type="checkbox"/> To:	Batch size:		
PUBLIC:telnet SIP 189_168_10_22		5/3/05	09:22:01	5/3/05	09:37:01	100		
Severity	DateTime	SourceIP	DestinationIP	EventName				
	2005.05.03 / 09:25:24 EDT	189.168.10.22	189.168.10.23	Attempted_telnet	0			
	2005.05.03 / 09:25:22 EDT	189.168.10.22	189.168.10.23	Attempted_telnet	0			
	2005.05.03 / 09:25:20 EDT	189.168.10.22	189.168.10.23	Attempted_telnet	0			
	2005.05.03 / 09:25:18 EDT	189.168.10.22	189.168.10.23	Attempted_telnet	0			
	2005.05.03 / 09:25:16 EDT	189.168.10.22	189.168.10.23	Attempted_telnet	0			
	2005.05.03 / 09:25:14 EDT	189.168.10.22	189.168.10.23	Attempted_telnet	0			
	2005.05.03 / 09:25:12 EDT	189.168.10.22	189.168.10.23	Attempted_telnet	0			
	2005.05.03 / 09:25:10 EDT	189.168.10.22	189.168.10.23	Attempted_telnet	0			
	2005.05.03 / 09:25:08 EDT	189.168.10.22	189.168.10.23	Attempted_telnet	0			
	2005.05.03 / 09:25:06 EDT	189.168.10.22	189.168.10.23	Attempted_telnet	0			

Batch received, click More for additional results. Complete through 5/3/05 9:25:24

22%

Count: 100

If you want to see how often in general this user is attempting telneting, 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 or W.

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
- ICMP and UDP Flood
- Packet Sniffing
- Denial of Service
- Smurf and Fraggle
- Dictionary Attack

Creating Incidents

NOTE: To perform this function you must have user permission to create Incidents.

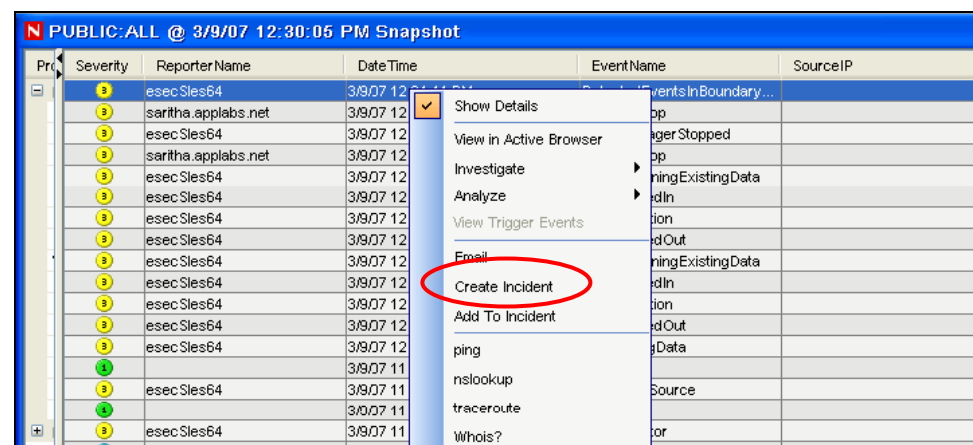
This is useful in grouping a set of events together as a whole representing something of interest (group of similar events or set of different events that indicate a pattern of interest such as an attack).

NOTE: If events are not initially displayed in a newly created Incident, it is most likely due to a lag in the time between display in the Real Time Events window and insertion into the database. If this occurs, it may 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*.



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:** Asset attack and alert information
 - **iTRAC:** Under this tab, you may assign an iTRAC Process
 - **History:** Incident history
 - **Attachments:** You may attach any document or text file with pertinent information to this incident
 - **Notes:** You may enter any general notes you would need to refer regarding this incident.
3. In the Create Incident dialog box, enter:
 - Title
 - State
 - Severity
 - Priority
 - Category
 - Responsible
 - Description
 - Resolution
4. Click Create. The incident is added under the Incidents tab of the Sentinel Control Center.

iTRAC

Instantiating a Process

An iTRAC process may 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 association a process to an incident, see [Chapter 3 “Correlation Tab”](#) and [Chapter 4 “Incidents Tab”](#).

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.

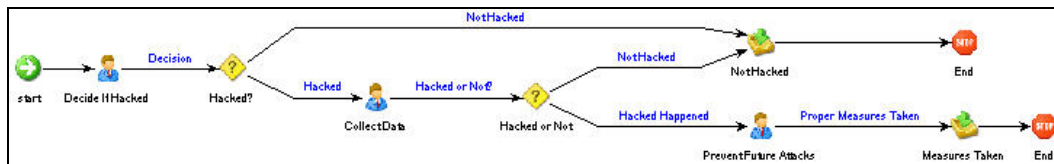
This discusses how to make a simple two tiered iTRAC Process. The process is flow of steps that can be taken in the event there is a possible attack on your system.

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.

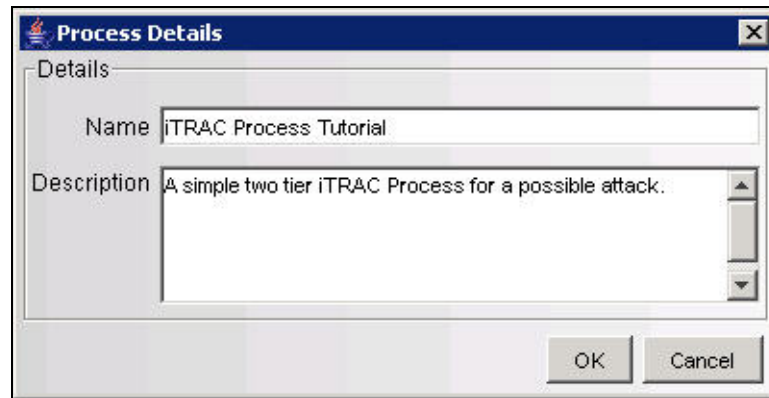
NOTE: All Decision Steps provide different execution paths depending on the value of the variable defined in the previous step.

- 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.



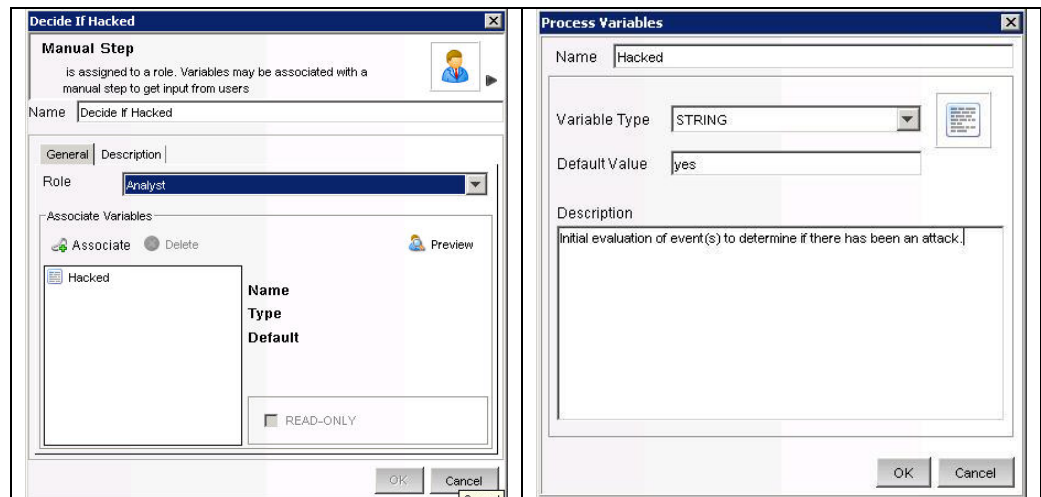
To Create an iTRAC Process:

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 will open with a Process Details Window. Enter the name *iTRAC Tutorial*. Optionally, add a description.



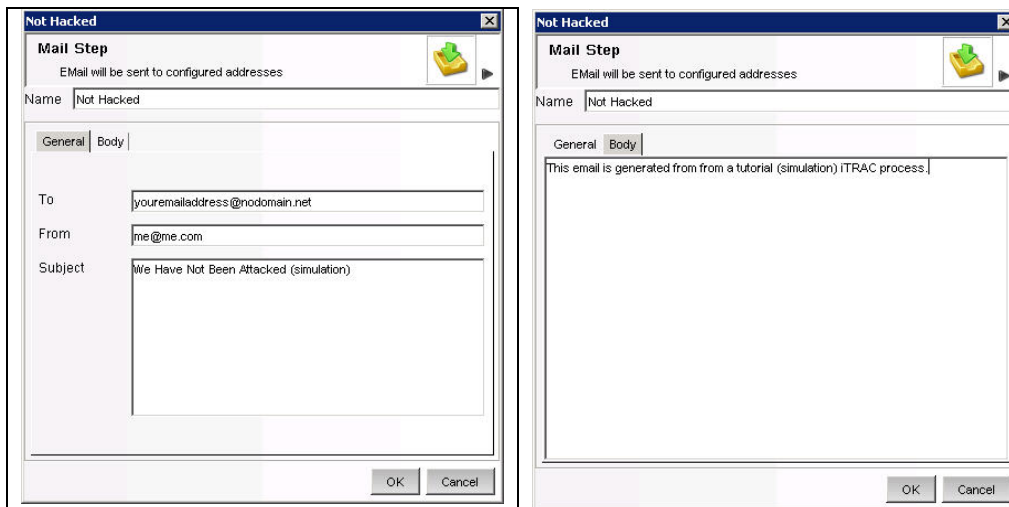
5. From the Step Palette pane, drag and drop three Manual Steps, two Mail Steps, and two Decision Steps. Rename and the attributes to the steps as follows by right-clicking and selecting *Edit Step*.

- Manual Step-0 to *Decide If Hacked*
 - set Role to *Analyst*
 - click *Associate*
 - click *Add*
 - enter *Hacked* in the Name field
 - in the Process Variables window select the Variable Type as *String*
 - enter default value of *yes*

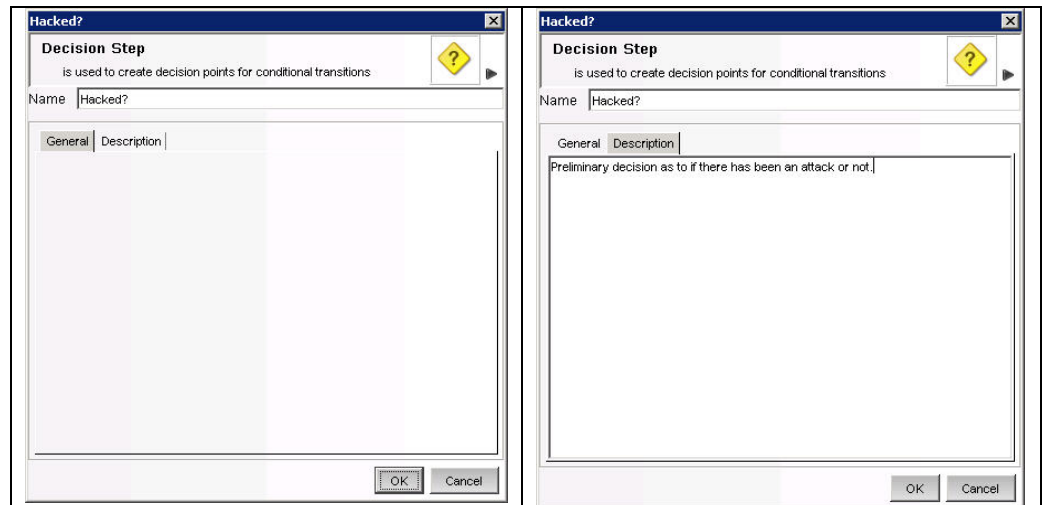


- under the Description tab, (optional) enter *Initial evaluation of event(s) to determine if there has been an attack*
- click OK
- highlight the newly created association, continue to click OK until the step is renamed
- Manual Step-1 to *Collect Data*
 - set Role to *Analyst*
 - click *Associate*
 - highlight *Hacked*, click OK
 - under the Description tab, (optional) enter *To further evaluate after collecting of events to determine if there has been an attack.*

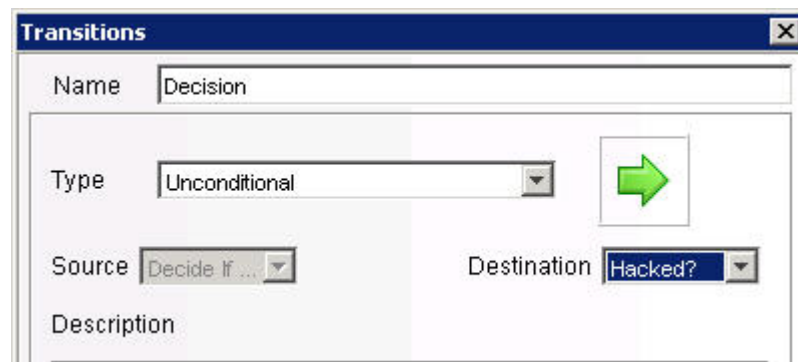
- click *OK*, the step should be renamed
- Manual Step-2 to *Prevent Future Attacks*
 - set Role to *Analyst*
 - under the Description tab, (optional) enter *Take measures to stop the attack (firewall, router or other intrusion protection method). Also, if possible, determine how the attacked was done.*
 - click *OK*, the step should be renamed
- Mail Step-3 to *Not Hacked*
 - in the To field, (since this is for tutorial) enter your email address. When this step completes it will send you an email
 - in the From field, enter a 'made up' address such as *me@nowhere.com*
 - in the Subject field, enter *We have not been hacked.*
 - Under the Body tab, (optional) enter *This email is generated from from a tutorial (simulation) iTRAC process.*



- click *OK*
- Mail Step-4 to *Prevent Future Attacks*
 - in the To field, enter your email address
 - in the From field, enter a 'made up' email address
 - in the Subject field, enter *Proper Attack Measures Taken*
 - Under the Body tab, (optional) enter *This email is generated from from a tutorial (simulation) iTRAC process.*
- Decision Step-5 to *Hacked?* (optional) Under the Description tab, (optional) enter 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 may enter a description such as *Decision as to if there has been an attack or not*.
6. Right-click on *Start* and select *Add Start Transition*. Select destination to step *Decide If Hacked*.
 7. Right-click on *Decide If Hacked* and select *Add Transition*. Select and enter the following:
 - Name, enter *Decision*
 - Type, select *unconditional*
 - Destination: *Hacked?*

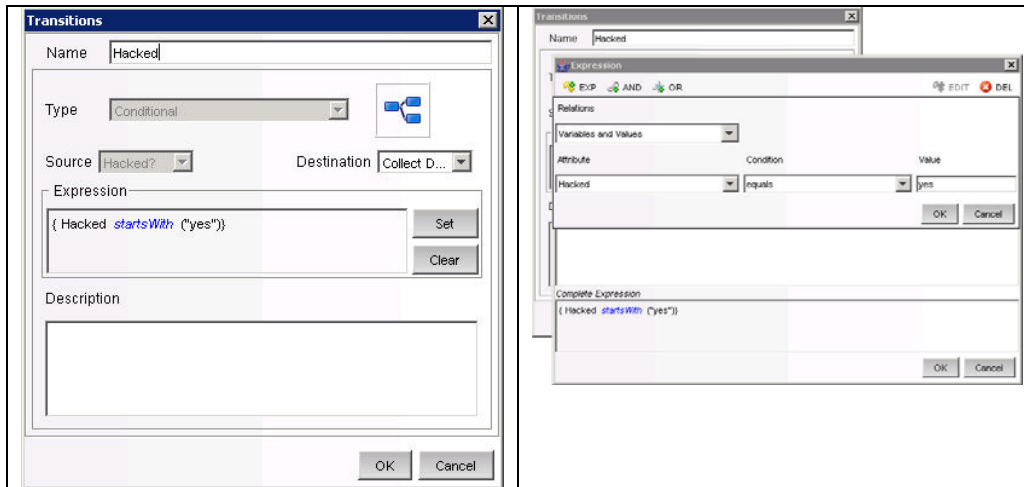


- Click *OK*
8. Right-click on *Hacked?* and select *Add Transition*. Select and enter the following:
 - Name, enter *Not Hacked*
 - Type, select *else*
 - Destination: *Not Hacked*
 - Click *OK*

NOTE: A decision step provides different execution paths depending on the value of the variable defined in the previous step. A Decision Step may have more than two transitions.

9. Right-click on *Not Hacked* and select *End Transition*.
10. Right-click on *Hacked?* and select *Add Transition*. Select and enter the following:
 - Name, enter *Hacked*

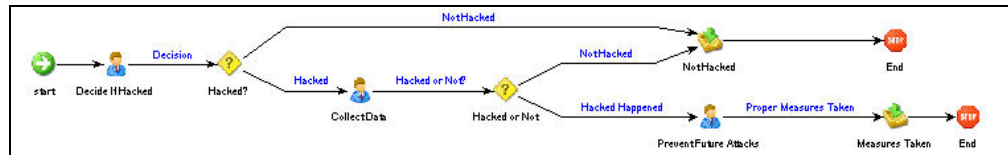
- Type, select *Conditional*
- Destination: *Collect Data*
- Click *Set > EXP*
 - Select Variables and Values
 - Select Attribute *Hacked*
 - Select Condition *equals*
 - Enter Value of *yes*



- Click OK until the transition is complete
11. Right-click on *Collect Data* and select *Add Transition*. Select and enter the following:
 - Name, *Hacked or Not?*
 - Type, *Unconditional*
 - Destination, *Hacked or Not*
 12. Right-click on *Hacked or Not* and select *Add Transition*. Select and enter the following:
 - Name, *Not Hacked*
 - Type, *Else*
 - Destination, *Not Hacked*
 13. Right-click on *Hacked or Not* and select *Add Transition*. Select and enter the following:
 - Name, *Hack Happened*
 - Type, *Conditional*
 - Destination, *Prevent Future Attacks*
 - Click *Set > EXP*
 - Select Variables and Values
 - Select Attribute *Hacked*
 - Select Condition *equals*
 - Enter Value of *yes*
 - Click OK until the transition is complete
 14. Right-click on *Prevent Future Attacks* and select *Add Transition*. Select and enter the following:

- Name, *Proper Measures Taken*
- Type, *Unconditional*
- Destination, *Measures Taken*

15. Right-click on *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](#)”.

- All steps within the process belong to the Analyst group

NOTE: By assigning steps to other roles, would 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 will has to first be assigned to an incident.

To Start or Terminate a Process:

1. Click the Incident tab.
2. Click *Incidents > Create Incidents*.
3. Enter 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.

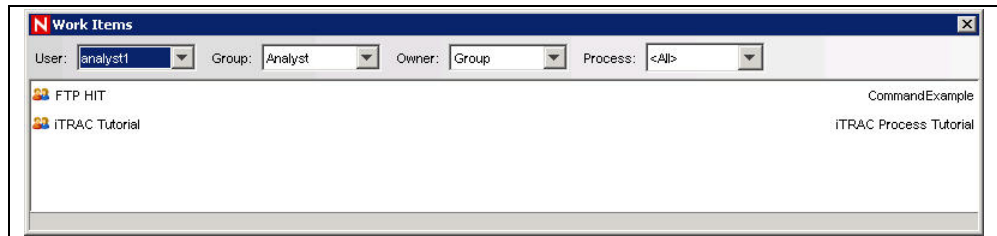
NOTE: Since this is a tutorial Incident and not a true Incident, it can be deleted without negatively affecting your Sentinel setup.

6. From anywhere in the Sentinel GUI, click on the Analyst group (yellow bar) under View work items.

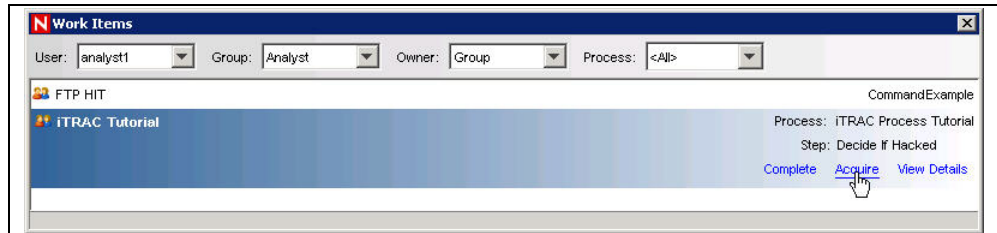


NOTE: Your bar may already be partially green indicating that you have accepted (acquired) an iTRAC Process.

7. All of the processes assigned to the Analyst role will be displayed.



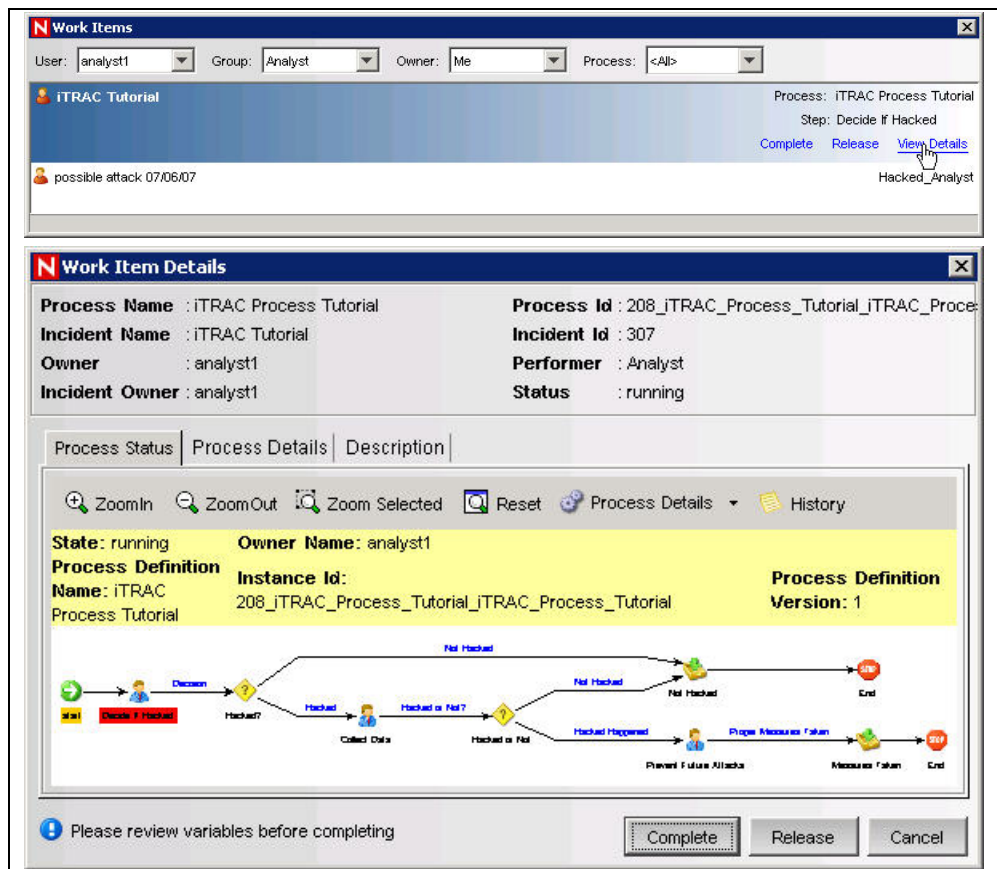
8. To accept a Work Item, highlight *iTRAC Tutorial* and click *Acquire*.



If the View Work Item list bar was yellow as illustrated above, it will change with an addition of a green bar.



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.

Process Name : iTRAC Process Tutorial	Process Id : 208_iTRAC_Process_Tutorial_iTRAC_Proce
Incident Name : iTRAC Tutorial	Incident Id : 307
Owner : analyst1	Performer : Analyst
Incident Owner : analyst1	Status : running

Process Status | **Process Details** | Description

Hacked:

Comments: Attachments:

{Comments and attachments will be added to associated incident}

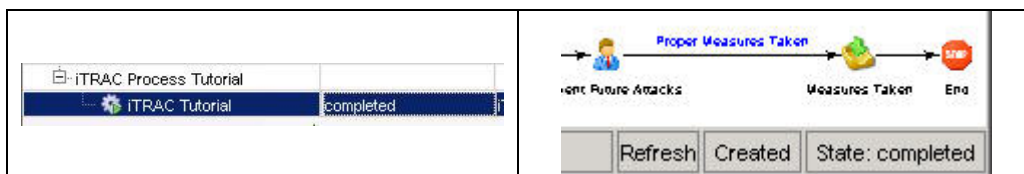
Please review variables before completing

For this manual step the variable *yes* is entered. Entering 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 will appear. 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 would 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. Once this is done, as before it would 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 will indicate as Complete or if you double-click on this process, it will indicate as complete.



Report Analyst

NOTE: Assumption, your Security Administrator has configured your Crystal Enterprise web server and published a list of available reports.

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 may be different, Sentinel Crystal Reports are 'living' reports. They under constant updating.

For example, if you are responsible for generating reports to upper management within your organization. Chances are you will run SourceDestinationReports. 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:

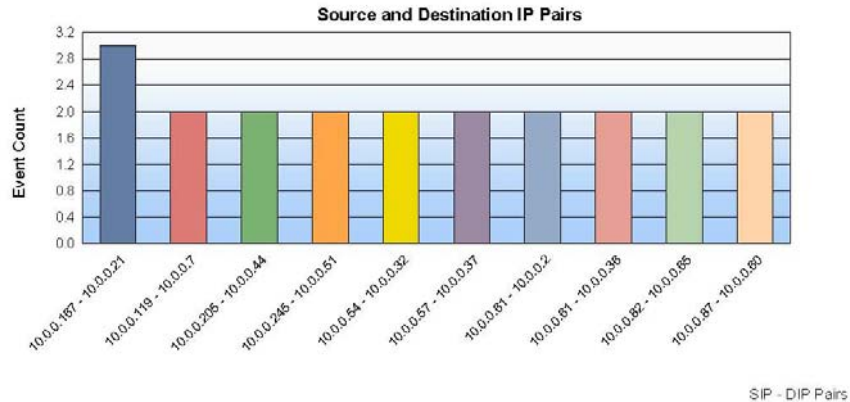
1. Expand *Top 10* and highlight *Top 10 Source to Destination IP Pairs* and click *Create Reports* (magnifying glass).
2. Enter Sentinel Report User (for SQL authentication and Oracle) as the username or your Windows Authentication username and enter your password.
3. Under Report Type, select one of the following:
 - Specific Date Range
 - Prior Day
 - Daily Report
 - Weekly Report
 - Monthly Report

NOTE: Other reports may have additional parameters such as resource name and severity range.

4. Click OK. The following is a sample monthly report.

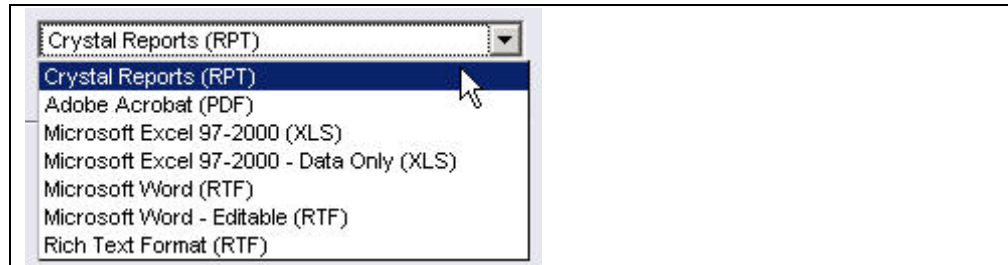
Top 10 Source to Destination IP Pairs: Monthly

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 - 07-09-2007 11:59:59 PM



Source IP	Destination IP	Number of Occurrences
10.0.0.167	10.0.0.21	3
10.0.0.61	10.0.0.2	2
10.0.0.119	10.0.0.7	2
10.0.0.54	10.0.0.32	2
10.0.0.81	10.0.0.38	2
10.0.0.57	10.0.0.37	2
10.0.0.205	10.0.0.44	2
10.0.0.245	10.0.0.51	2
10.0.0.87	10.0.0.60	2
10.0.0.82	10.0.0.65	2

- You can export this file as a Word, pdf, rtf, Excel 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 [“Security Analyst - Event Query Sample Scenario”](#).

Administrators

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.

In reference to the telnet scenario under section “**Security Analyst - Event Query Sample Scenario**”, a Simple Correlation Rule can be created that will trigger a correlated event when a telnet attempt is done.

To Create a Simple Correlation Rule:

1. Click the *Correlation* tab and highlight *Correlation Rule Manager* in the navigation bar.
2. In the *Correlation Rule Manager* window, click *Add*.
3. Click *Simple* to create a simple rule.
4. Select *Fire if All* (in the drop-down menu).

Fire if All **of the following conditions are met:**

5. Enter the following:
 - SourceIP = 189.168.10.22
 - EventName = Attempted_telnet
 - Severity = 5
 - SensorType = C
 - DestinationIP = 189.168.10.23

SourceIP	=	189.168.10.22
EventName	=	Attempted_telnet
Severity	=	5
SensorType	=	C
DestinationIP	=	189.168.10.23

NOTE: The source and destination IP are from the same internal network. This is a correlation rule monitor an internal telnet attempt. Many network attacks originate inside the network.

Click *Next*.

6. To have this rule fire as many times as possible, select *Continue to perform actions every time this fires*.

After rule fires:

☒ Continue to perform actions every time this rule fires

Click *Next*.

7. In the General Description window, enter a name. Recommend a name and description that indicates that this is tutorial rule and may not be germane to the network.

General Description

Name
Tutorial_telnet_attempt_SIP_189_168_10_22

Namespace
Correlation Rules

Description
This is a tutorial correlation rule. The parameters used in this rule may not be germane this network.

Click *Next*.

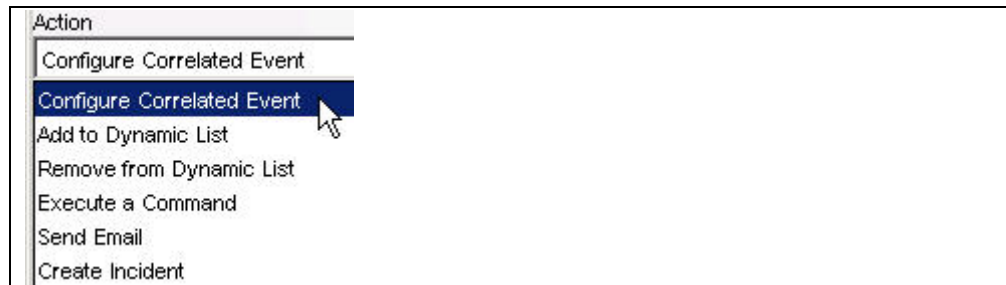
8. Select not to create another rule, click *Next*.

To Deploy the Simple Correlation Rule:

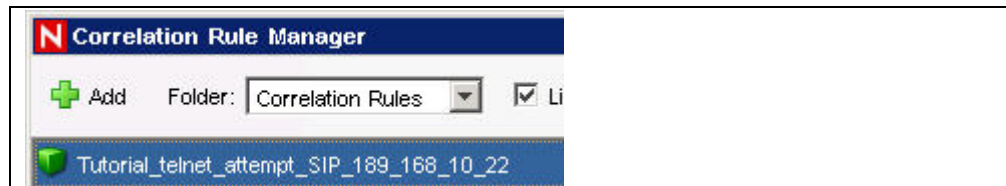
1. Click the *Correlation* tab and highlight *Correlation Rule Manager* in the navigation bar.
2. Click *Deploy Rule*.



3. (optional) In the Deploy Rule window, you can add an action. This allows you to:
 - Configure Correlated Event
 - Add to Dynamic List
 - Remove from Dynamic List
 - Execute a Command
 - Send Email
 - Create Incident

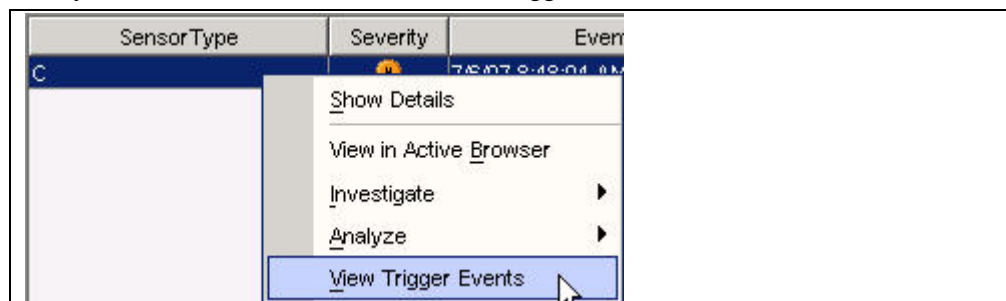


Click *Next*. The will indicate deployed by the color green.



To view what events triggered your correlated event:

1. Right-click on the correlated event and select *View Trigger Events* to see how many telnet events (could be more than 1) triggered this correlation rule.



A 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 provides you the functional and technical architecture of Sentinel.

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 to 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).

Functional Architecture

Sentinel is composed of three component subsystems, which form the core of the functional architecture:

- **“iSCALE Platform”**: An event-driven scalable framework
- **“Event Source Management”**: An extensible framework built to manage and monitor connections between Sentinel and third-party event sources using Sentinel Connectors and Sentinel Collectors.
- **“Application Integration”**: 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.

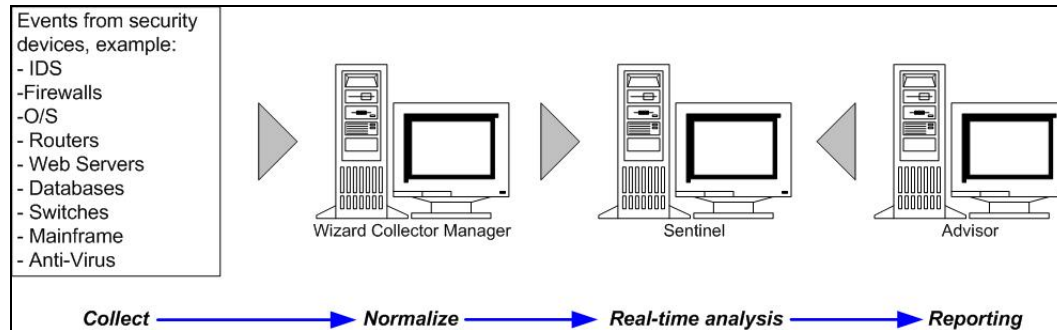
Architecture Overview

The Sentinel system is responsible for receiving events from the Collector Manager. The events are then displayed in real-time 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 Sentinel's 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.



iSCALE Platform

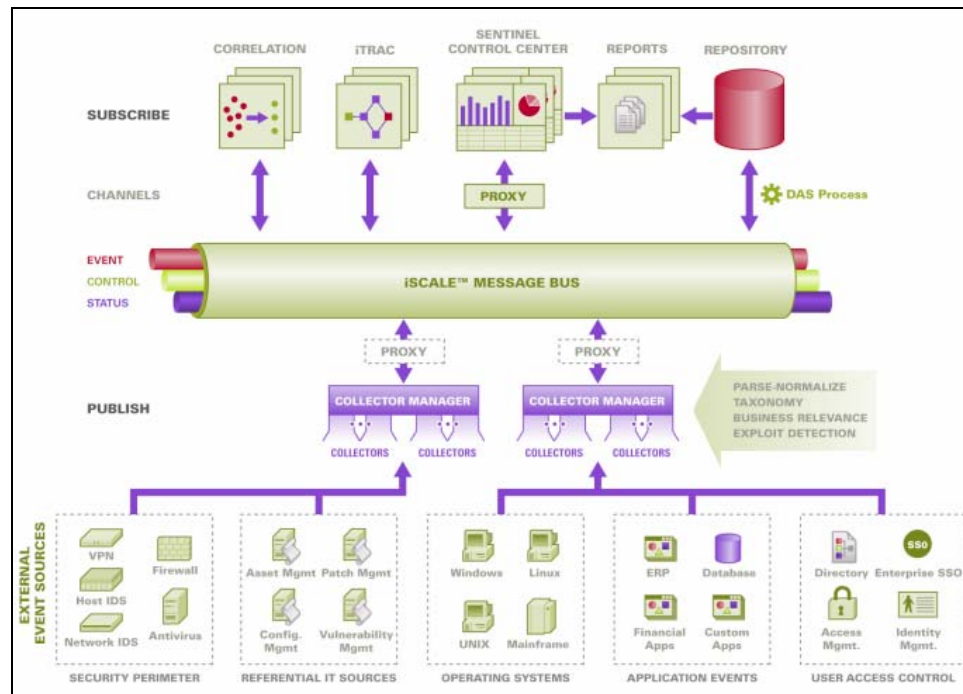
Sentinel's iSCALE™ architecture is built using a standards-based, Service-Oriented Architecture (SOA) that combines the advantages of in-memory processing and distributed computing. iSCALE is a specialized message bus capable of handling high data volumes.

Message Bus

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 message bus' unique features, 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 failure state.



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 since each customer's environment varies: one site may have a large number of devices with low event volumes; another site may 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.

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 installation, see [Advisor Configuration](#) in *Sentinel 6.0 Installation Guide*.

The supported systems are:

Intrusion Detections Systems

- Cisco Secure IDS
- Enterasys Dragon Host Sensor
- Enterasys Dragon Network Sensor
- Intrusion.com (SecureNet_Provider)
- ISS BlackICE
- ISS RealSecure Desktop
- ISS RealSecure Network
- ISS RealSecure Server
- ISS RealSecure Guard
- Snort
- Symantec Network Security 4.0 (ManHunt)
- Symantec Intruder Alert
- McAfee IntruShield

- Vulnerability Scanners
- eYE Retina
- Foundstone Foundscan
- ISS Database Scanner
- ISS Internet Scanner
- ISS System Scanner
- ISS Wireless Scanner
- Nessus
- nCircle IP360
- Qualys QualysGuard

Intrusion Protection System

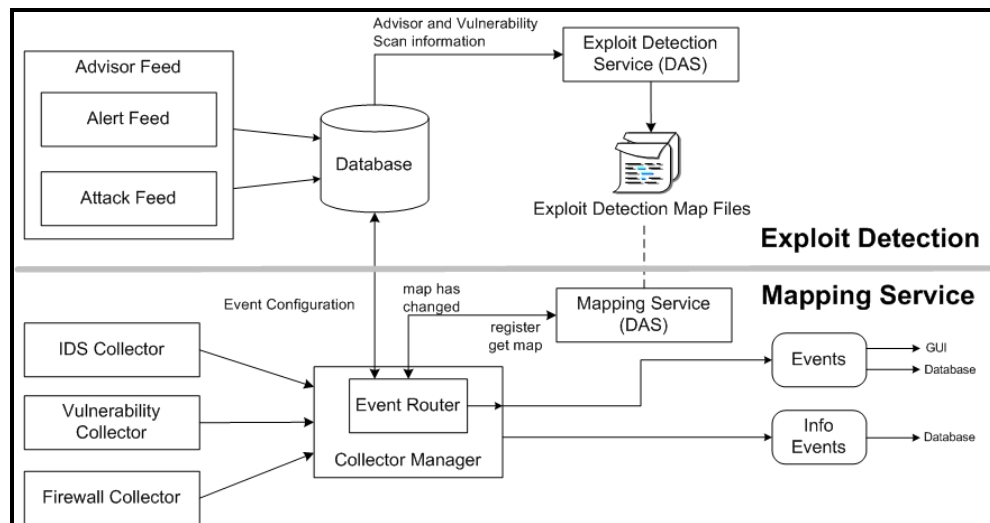
- ISS Proventia

Firewalls

- Cisco IOS Firewall

You will require at least one vulnerability scanner and either an IDS, IPS or firewall from each category above. The IDS and Firewall DeviceName (rv31) has to appear in the event as hi-lighted in gray above. 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 will generate one or two files depending upon what kind of data has been updated.



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' detect attacks (if any) against these vulnerable areas. Firewalls detect if any traffic is against any of these vulnerable area. If an attack is associated with any vulnerability, the asset has been exploited.

The Exploit Detection Service generates two files located in:

`$ESEC_HOME/bin/map_data`

The two files are `attackNormalization.csv` and `exploitDetection.csv`.

The attackNormalization.csv is generated after:





- Advisor feed
- DAS Startup (if enabled in das_query.xml, disabled by default)

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 will have the scroll icon).

- Vulnerability
- AttackId

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.

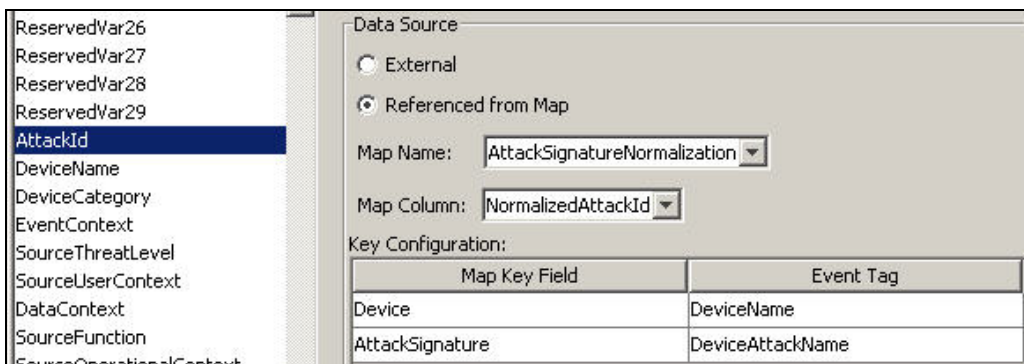
Sentinel comes pre-configured with the following map names associated with attackNormalization.csv and exploitDetection.csv.

Map Name	csv File Name
▪ AttackSignatureNormalization	▪ attackNormalization.csv
▪ IsExploitWatchlist	▪ exploitDetection.csv

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 AttackId tag has the Device (type of the security device, for example, Snort) and AttackSignature columns set as Keys and uses the NormalizedAttackID column in the attackNormalization.csv file. In a row where the DeviceName event tag (an IDS device such as Snort, information filled in by Advisor and Vulnerability information from the Sentinel Database) is the same as Device and where the DeviceAttackName event tag (attack information filled in by Advisor information in the Sentinel Database through the Exploit Detection Service) is the same as AttackSignature, the value for AttackId is where that row intersects with the NormalizedAttackID column.



Map Key Field	Event Tag
Device	DeviceName
AttackSignature	DeviceAttackName

Key	Key	NormalizedAttackId	AttackId entry
Secure	BackDoorProbe (TCP 1234)	3	Trojan: Backdoor.SubSeven
Secure	BackDoorProbe (TCP 1999)	3	Trojan: Backdoor.SubSeven
Dragon	RWALLD:SYKLOG-FORMAT	4	Sun Microsystems Solaris rwall Elevated F
Snort	RPC UDP rwallid 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

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).

Vulnerability

Label: Vulnerability

Description: The vulnerability of the asset identified in this event.

Data Source:

☐ External

☒ Referenced from Map

Map Name: IsExploitWatchlist

Map Column: _EXIST_

Key Configuration:

Map Key Field	Event Tag
IP	DestinationIP
NormalizedAttackId	AttackId

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) 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.

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® and HP OpenView's ServiceDesk® -allowing straightforward integration with external systems.

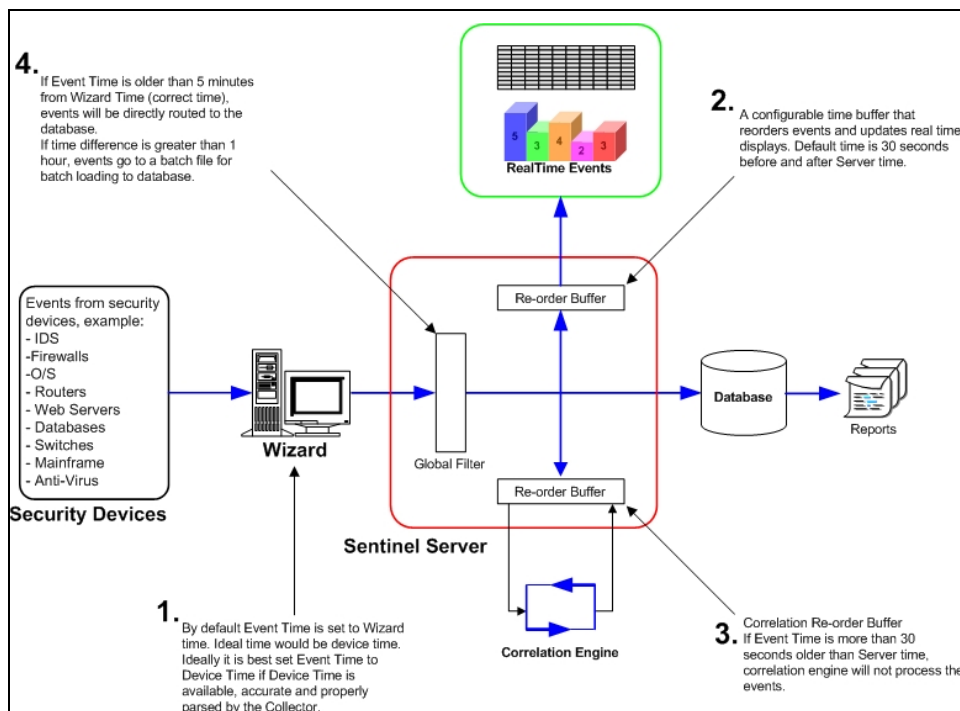
The API is Web Services-based and therefore allows any external systems that are SOAP-aware to take advantage of pervasive integration with the Sentinel system.

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 may 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 comprises 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.



1. By default, Event Time is set to Collector Manager time. Ideal time would be device time. Therefore it would be best to set Event Time to Device Time if Device Time is available, accurate and properly parsed by the Collector.
2. A configurable time buffer that reorders events and updates real time displays. Default time is 30 seconds before and after server time.
3. Correlation Re-order buffer, if event time is more than 30 seconds older than Server time, correlation engine will not process the events.
4. If event time is older than 5 minutes from Collector Manager Time (correct time), events will be directly routed to the database.

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, subresource, 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.

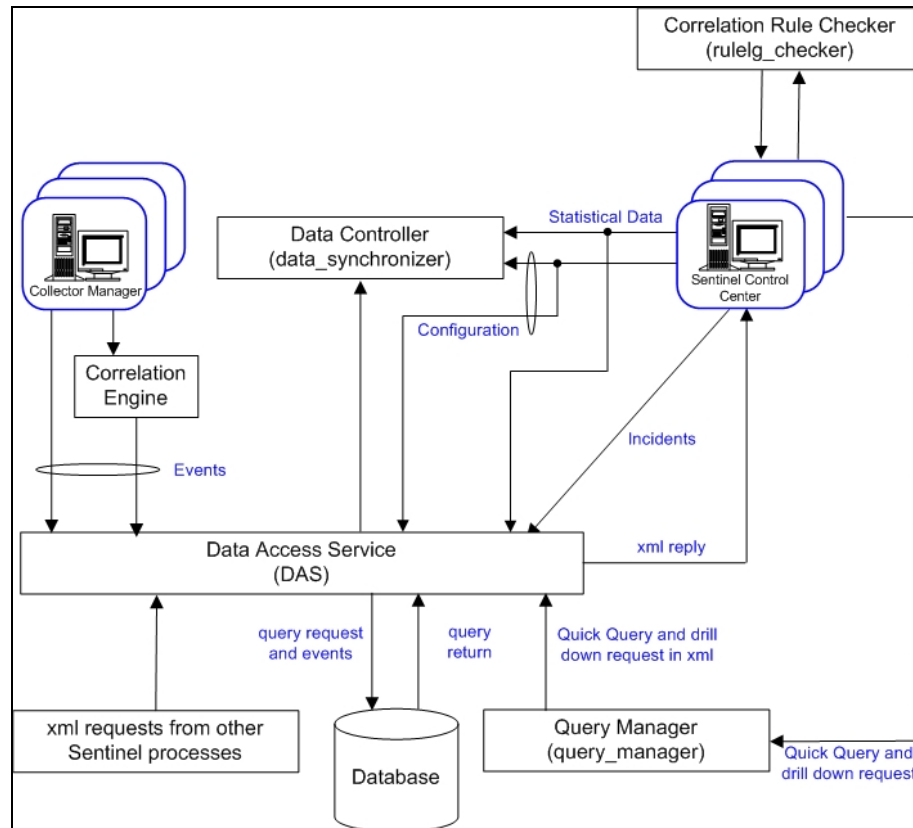
For more information, see [Appendix B, "System Events for Sentinel"](#).

Processes

The following processes and Windows service communicate with each other through iSCALE - the message-oriented middleware (MOM).

- **"Sentinel Service (Watchdog)"**
- **"Data Access Service (DAS)"**
 - **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"** (correlation_engine)
- **"Collector Manager"**
- **"iSCALE"**

The following is the architecture for Sentinel Server.



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

Message-oriented middleware (MOM) that provides the communication platform for all other Sentinel processes.

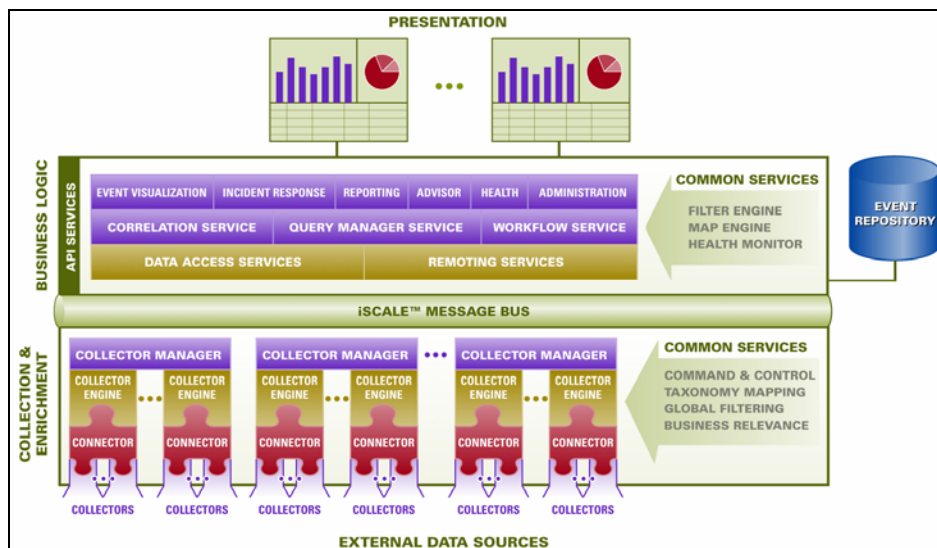
Logical Architecture

Sentinel is composed of three logical layers:

- “Collection and enrichment layer”
- “Business logic layer”
- “Presentation layer”

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.



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.

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

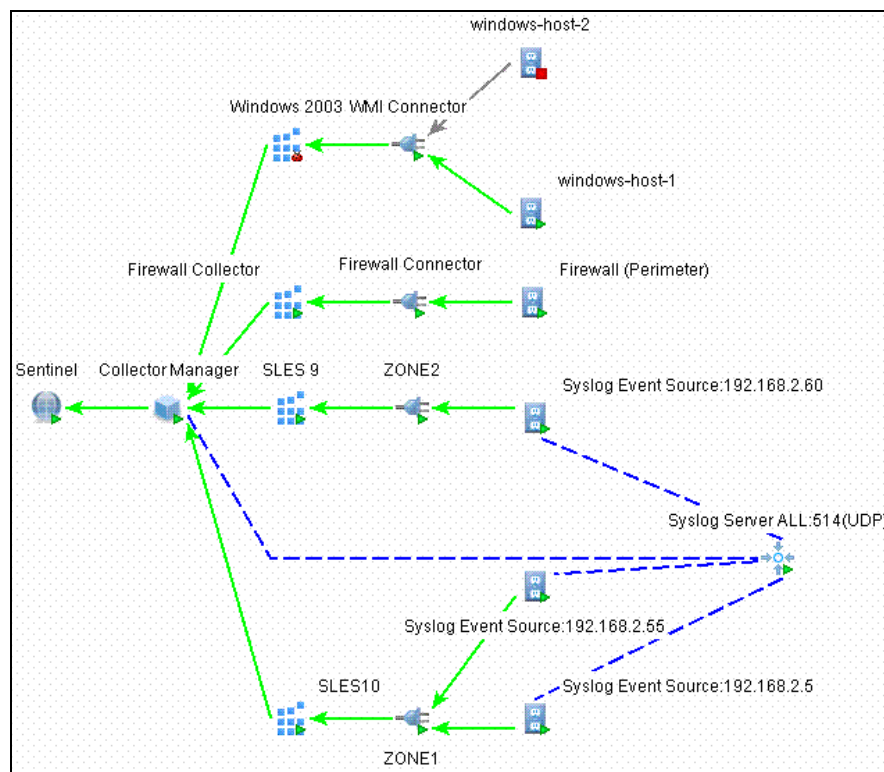
Collector Manager manages the Collectors, monitors system status messages and performs event filtering as needed. Main functions of the Collector Manager include transforming events, adding business relevance to events through taxonomy, performing global filtering on events, routing events and sending 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:



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 plugin. 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 plugin. 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.

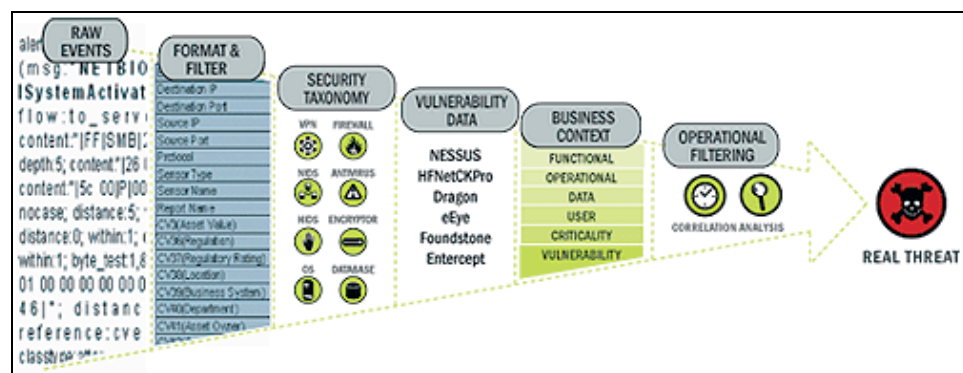
Common Services

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

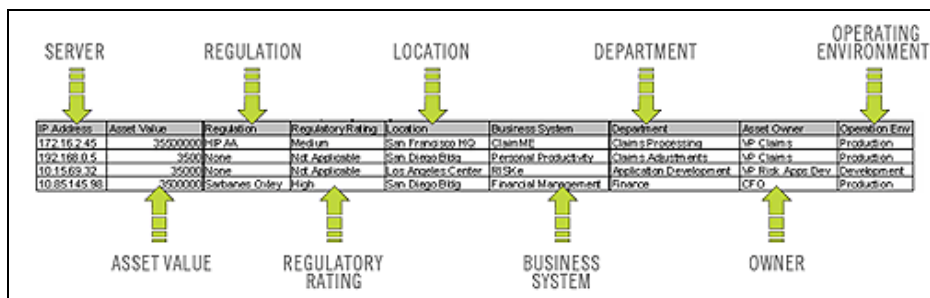
Nearly all security products produce events in different formats and with varying content. For example, Windows and Solaris report a failed login differently.

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.



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. Once this information is added into the system, all other components can take advantage of the additional context.



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.

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”
- “Data Access Service”
- “Query Manager Service”
- “Correlation Service”
- “Workflow Service”
- “Event Visualization”
- “Incident Response”
- “Reporting”
- “Advisor”
- “Health”
- “Administration”

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, since 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 and optionally high-performance event insert strategies using native connectors (that is, OCI for Oracle 9i and ADO for Microsoft SQL Server).

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 may 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 may 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 may reference named dynamic lists to perform lookups on list members. For example, a rule may 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.

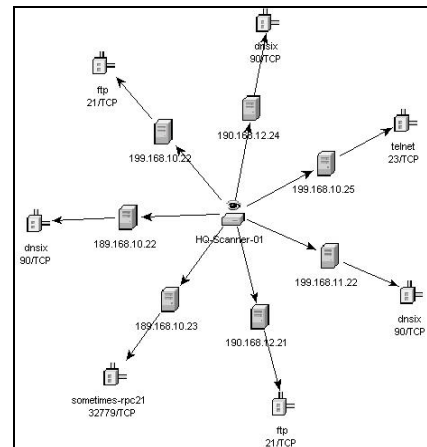
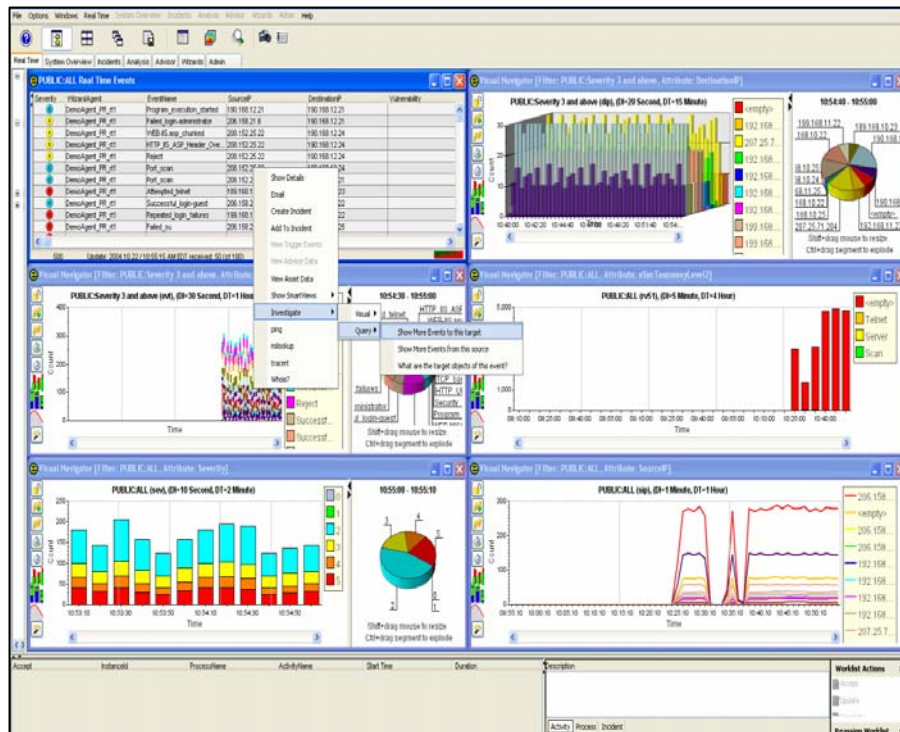
Workflow Service (iTRAC)

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 may 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.

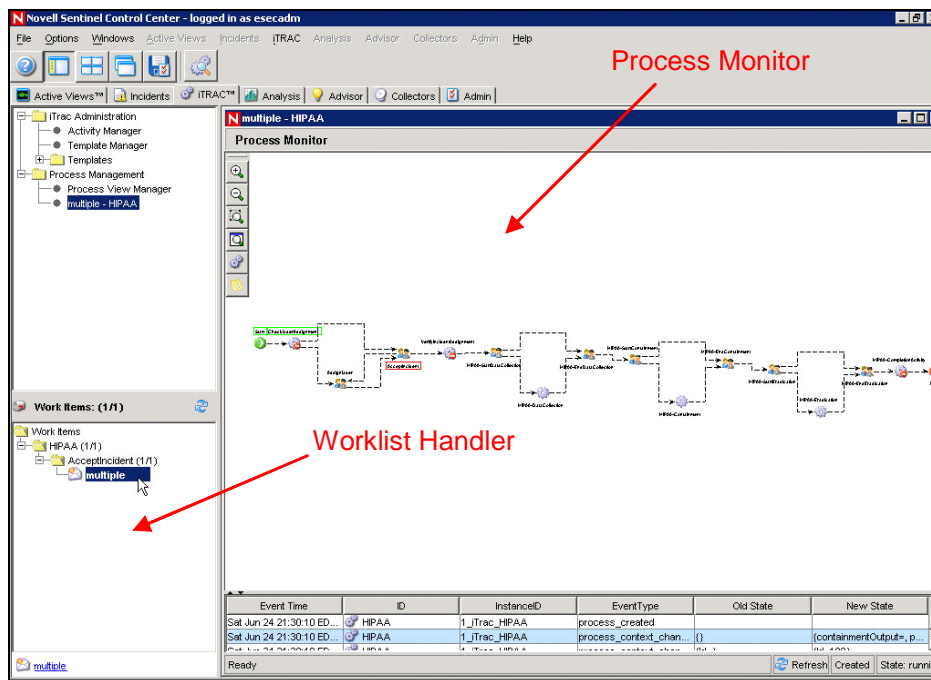
Because Active Views uses the iSCALE architecture, analysts can quickly drill down for further analysis because Active Views provides direct access to the real-time memory-resident event data, which easily handles thousands of events per second without any performance degradation. Data is kept in memory 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.



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 once 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.



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 XPDL (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.

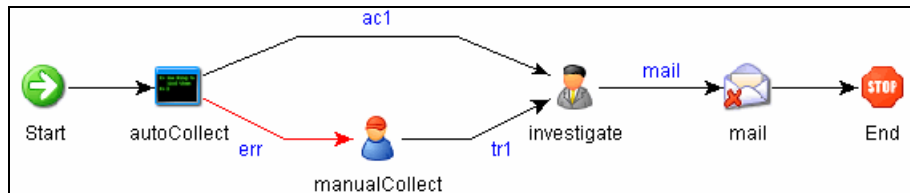
The iTRAC system uses three Sentinel 6 objects that may be defined outside the iTRAC framework:

- **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 may be assigned to a Role.

Sentinel 6 workflows have four major components that are unique to iTRAC:

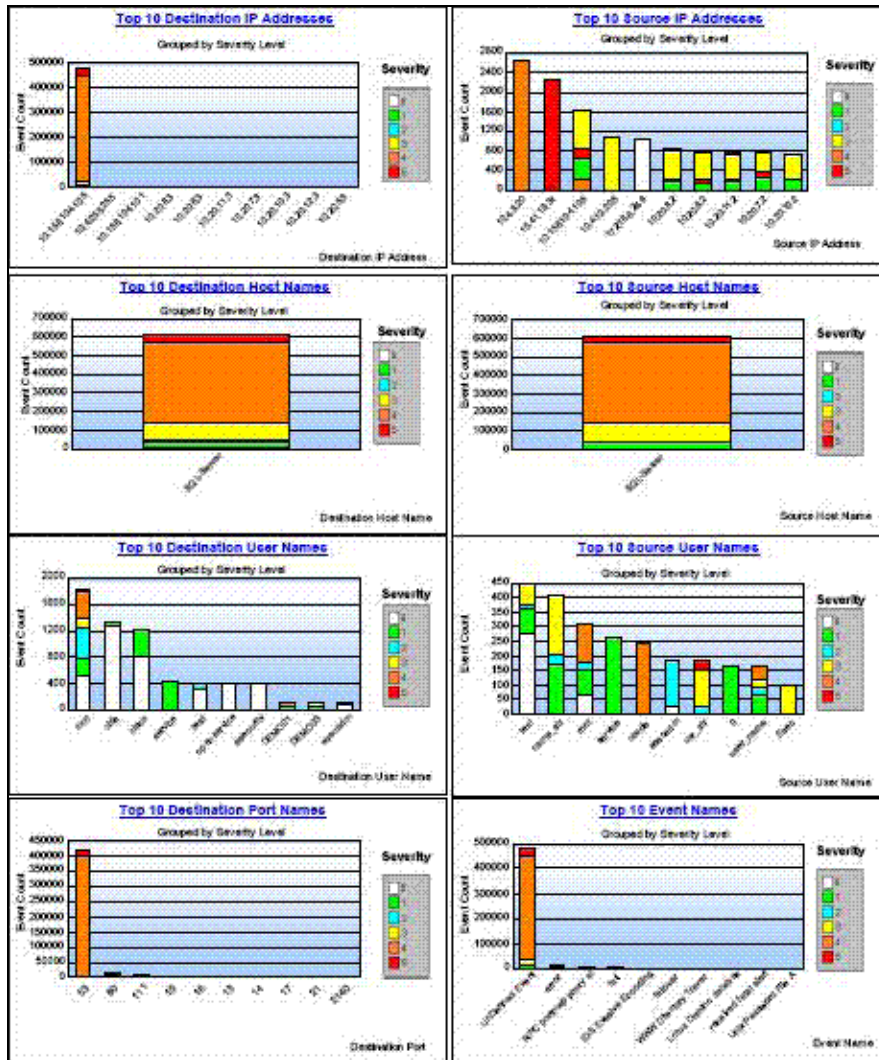
- **Step:** A Step is an individual unit of work within a workflow; there are manual steps, decision steps, command steps, mail steps, and activity-based steps. Each step appears as an icon within a given workflow template.
- **Transition:** A Transition defines how the workflow will move from one state (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 once a process based on that template is instantiated. A template may 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.



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



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.

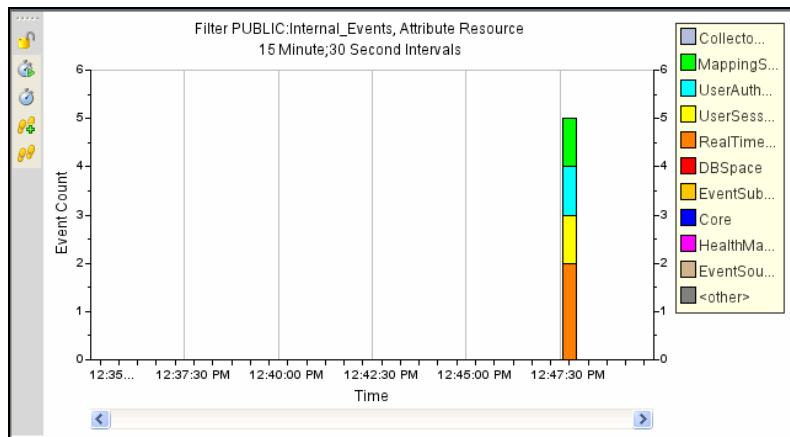
Presentation Layer

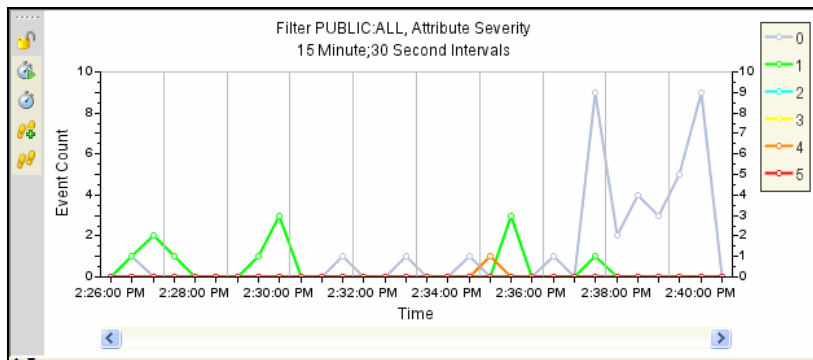
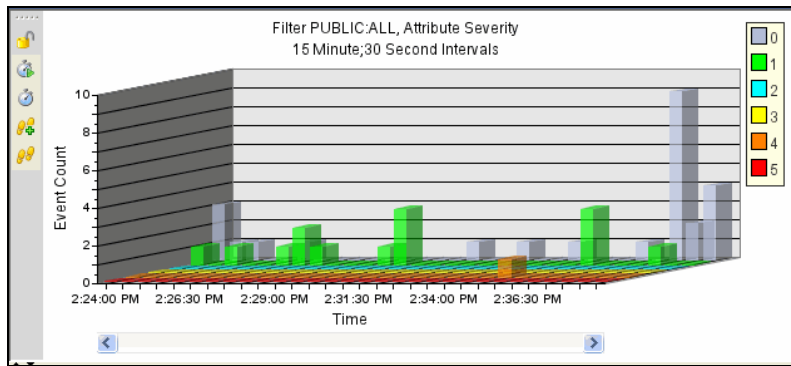
The presentation layer renders the application interface to the end user. The Sentinel Control Center is a comprehensive dashboard that presents information to the user.

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.

Severity	EventTime	EventName	EventID	SourceID	Collector
3	5/8/07 12:33:31 PM	DbSpaceLow	B30E4A43-DAB9-1029-9D0A-00123...	A6C489C0-DAB9-1029-9F5C-00123F9...	
3	5/8/07 12:33:31 PM	DbSpaceLow	B30E4A43-DAB9-1029-9D08-00123...	A6C489C0-DAB9-1029-9F5C-00123F9...	
3	5/8/07 12:33:31 PM	DbSpaceLow	B30E4A43-DAB9-1029-9D04-00123...	A6C489C0-DAB9-1029-9F5C-00123F9...	
3	5/8/07 12:33:31 PM	DbSpaceLow	B30E4A43-DAB9-1029-9D01-00123...	A6C489C0-DAB9-1029-9F5C-00123F9...	

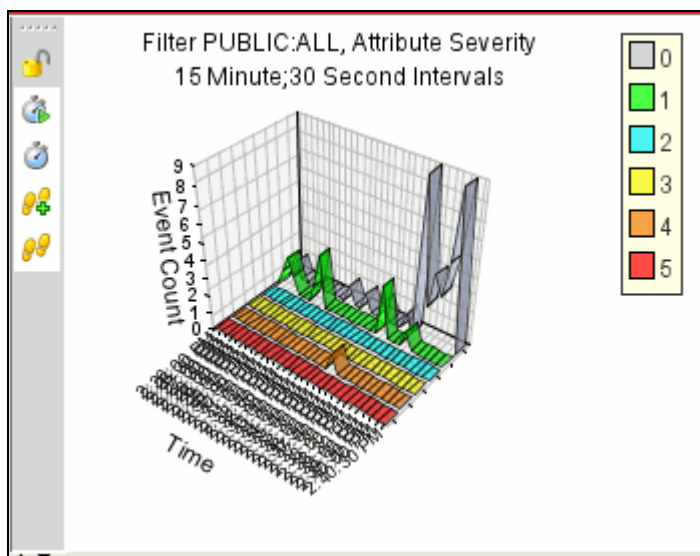
Graphical Format displays events as graphs. Stacked Bar 2D, Bar 3D, Line and Ribbon graphs are available for proper representation of information in graphical format.





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.



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, the user can choose 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.

B System Events for Sentinel

In the description tables below, words in italics surrounded by <...> are replaced by relevant values in the real messages.

Authentication Events

Failed Authentication

When a user authentication fails, the following event is generated.

Tag	Value
Severity	4
Event Name	AuthenticationFailed
Resource	UserAuthentication
SubResource	Authenticate
Message	Authentication of user <name> with OS name <domUser> from <IP> failed

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.

Tag	Value
Severity	4
Event Name	NoSuchUser
Resource	UserAuthentication
SubResource	Authenticate
Message	No existing user with name <name> found

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.

Tag	Value
Severity	4
Event Name	TooManyActiveUsers
Resource	UserAuthentication
SubResource	Authenticate
Message	Error in user table : Multiple users with the name <name> found

Locked Account

When a locked user account is attempting to login, the following event is generated.

Tag	Value
Severity	4

Tag	Value
Event Name	LockedUser
Resource	UserAuthentication
SubResource	Authentication
Message	Attempt to login using locked account <acct>

User Sessions

User Logged Out

When a user logs out, the following internal event is generated.

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 <num> active users

User Logged In

When a user logs in, the following internal event is generated.

Tag	Value
Severity	1
Event Name	UserLoggedIn
Resource	UserSessionManager
SubResource	User
Message	User <user> with OS name <osName> at <IP> logged in; currently <num> active users

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.

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 <num> active users

Event

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.

Tag	Value
Severity	3
Event Name	MoveArchiveFileFailed
Resource	<DAS name>
SubResource	ArchiveFile
Message	Error moving completed archive file <fname> to <dir>

Error inserting events

When inserting events into the database fails the following internal event is generated.

Tag	Value
Severity	5
Event Name	InsertEventsFailed
Resource	EventSubsystem
SubResource	Events
Message	Error inserting events into the Database—the events may be permanently lost. Please check the Database and backend server logs <Exception>

Opening Archive File failed

When opening an archive file for storing the events for aggregation fails, the following internal event is generated.

Tag	Value
Severity	3
Event Name	OpenArchiveFileFailed
Resource	<Das name>
SubResource	ArchiveFile
Message	Error opening archive file <name> in <dir>

Writing to Archive File failed

When opening an archive file for storing the events for aggregation fails, the following internal event is generated.

Tag	Value
Severity	3
Event Name	WriteArchiveFileFailed
Resource	<Das name>
SubResource	ArchiveFile
Message	Error writing newly received events to aggregation archive file <fname>

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.

Tag	Value
Severity	5

Event Name	InsertIntoOverflowPartition
Resource	EventSubSystem
SubResource	Events
Message	Error: currently inserting into the overflow partitions (P_MAX), add more partitions

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.

Tag	Value
Severity	4
Event Name	EventInsertionIsBlocked
Resource	EventSubSystem
SubResource	Events
Message	Event insertion is blocked, waiting <i><num></i> sec

Event Insertion is resumed

When event insertion is resumed after being blocked, the following event is sent.

Tag	Value
Severity	2
Event Name	EventInsertionResumed
Resource	EventSubSystem
SubResource	Events
Message	Event insertion has resumed after being blocked

Database Space Reached Specified Time Threshold

When event insertion is resumed after being blocked, the following event is sent.

Tag	Value
Severity	0
Event Name	DbSpaceReachedTimeThrshld
Resource	Database
SubResource	Database
Message	Tablespace <i><string></i> has <i><num></i> MB left and growing <i><num></i> bytes per second and will run out space within the time threshold specified <i><num></i> seconds

Database Space Reached Specified Percent Threshold

When event insertion is resumed after being blocked, the following event is sent.

Tag	Value
Severity	0
Event Name	DbSpaceReachedPercentThrshld
Resource	Database
SubResource	Database
Message	Tablespace <i><string></i> has current size of <i><num></i> MB with a max size of <i><num></i> MB

Tag	Value
	and has reached the percentage threshold of <num> %

Database Space Very Low

When event insertion is resumed after being blocked, the following event is sent.

Tag	Value
Severity	5
Event Name	DbSpaceVeryLow
Resource	Database
SubResource	Database
Message	Tablespace <string> has current size of <num> MB and has reached the physical threshold of <num> MB

Aggregation

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.

Tag	Value
Severity	4
Event Name	SummaryUpdateFailure
Resource	Aggregation
SubResource	Summary
Message	Error saving summary batch to the database for summary <summaryName>

Mapping Service

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 may happen if maps are created and deleted.

Tag	Value
Severity	4
Event Name	ErrorNoSuchMap
Resource	MappingService
SubResource	ReferentialDataObjectMap
Message	Error initializing map with id <ID>: no such map

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.

Tag	Value
Severity	1
Event Name	LoadingMapFromCache
Resource	MappingService
SubResource	ReferentialDataObjectMap
Message	Loading from cache v<version> of map <mapName> (ID <id>)

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.

Tag	Value
Severity	1
Event Name	RefreshingMapFromServer
Resource	MappingService
SubResource	ReferentialDataObjectMap
Message	Refreshing from server map <name> with id <ID>

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.

Tag	Value
Severity	4
Event Name	TimeoutRefreshingMap
Resource	MappingService
SubResource	ReferentialDataObjectMap
Message	Request timed out while refreshing map <name>: <exception>

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.

Tag	Value
Severity	4

Event Name	ErrorRefreshingMapData
Resource	MappingService
SubResource	ReferentialDataObjectMap
Message	Error refreshing map <mapName>: <exc>

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.

Tag	Value
Severity	0
Event Name	LoadedLargeMap
Resource	MappingService
SubResource	ReferentialDataObjectMap
Message	Finished loading map <name> with id <ID> and <num> entries and total size <#>Kb in <##>sec

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).

Tag	Value
Severity	0
Event Name	LongTimeToLoadMap
Resource	MappingService
SubResource	ReferentialDataObjectMap
Message	It took <##>sec to load map <name> with id <ID> and <num> entries and total size <##>Kb

TimedoutWaitingForCallback

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.

Tag	Value
Severity	2
Event Name	TimedoutWaitingForCallback
Resource	MappingService
SubResource	ReferentialDataObjectMap
Message	Map <name> timed out waiting for callback with new map data--retrying

ErrorApplyingIncrementalUpdate

This event is sent when the mapping service fails to apply an update to an existing client map.

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.

OutOfSyncDetected

This event is sent when the mapping service detects that a map is out of date. The mapping service will automatically schedule a refresh.

Tag	Value
Severity	2
Event Name	OutOfsyncDetected
Resource	MappingService
SubResource	ReferentialDataObjectMap
Message	Map <mapName> detected the map data is out-of-sync, probably due to a missed update notification--scheduling a refresh

Event Router

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.

Tag	Value
Severity	1
Event Name	EventRouterIsRunning
Resource	AgentManager
SubResource	EventRouter
Message	Event router completed its initialization in <mode> mode

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).

Tag	Value
Severity	1
Event Name	EventRouterInitializing
Resource	AgentManager
SubResource	EventRouter
Message	Event router is initializing in <mode> mode

Event Router is Stopping

This event is sent when a request is received by the event router to stop during shutdown.

Tag	Value
Severity	2
Event Name	EventRouterStopping
Resource	AgentManager
SubResource	EventRouter
Message	Event router is stopping

Event Router is Terminating

This event is sent when a request is received by the event router to stop during shutdown.

Tag	Value
Severity	2
Event Name	EventRouterTerminating
Resource	AgentManager
SubResource	EventRouter
Message	Event router is terminating

Correlation Engine

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.

Tag	Value
Severity	1
Event Name	EngineRunning
Resource	CorrelationEngine
SubResource	CorrelationEngine
Message	Correlation Engine is processing events.

Correlation Engine is Stopped

This event is sent out when the engine changes state from running to stopped.

Tag	Value
Severity	1
Event Name	EngineStopped
Resource	CorrelationEngine
SubResource	CorrelationEngine
Message	Correlation Engine has stopped processing events.

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.

Tag	Value
Severity	1
Event Name	DeploymentStarted
Resource	CorrelationEngine

SubResource	Deployment
Message	deployment <name> started

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.

Tag	Value
Severity	1
Event Name	DeploymentStopped
Resource	CorrelationEngine
SubResource	Deployment
Message	deployment <name> stopped

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.

Tag	Value
Severity	1
Event Name	DeploymentModified
Resource	CorrelationEngine
SubResource	Deployment
Message	Deployment <name> modified

WatchDog

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.

Tag	Value
Severity	1
Event Name	ProcessStart
Resource	WatchDog
SubResource	Process
Message	Process <ProgramName> spawned (<pid>)

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.

Tag	Value
Severity	1/5
Event Name	ProcessStop
Resource	WatchDog
SubResource	Process
Message	Process <ProgramName> exited with code <exit_code>

Watchdog Process is started

As the Watchdog process starts, the following internal event is generated.

Tag	Value
Severity	1
Event Name	ProcessStart
Resource	WatchDog
SubResource	WatchDog
Message	WatchDog Service Starting

Watchdog Process is stopped

When the Watchdog service is stopped, the following internal event is generated.

Tag	Value
Severity	5
Event Name	ProcessStop
Resource	WatchDog
SubResource	WatchDog
Message	WatchDog Service Ended

Collector Engine/Manager

Port Start

Collector Manager sends this event when a port is started.

Tag	Value
Severity	1
Event Name	PortStart
Resource	AgentManager
SubResource	AgentManager
Message	Processing started for port_<port id>

Port Stop

Collector Manager sends this event when a port is stopped.

Tag	Value
Severity	1
Event Name	PortStop
Resource	AgentManager
SubResource	AgentManager
Message	Processing stopped for port_<port id>

Persistent Process Died

Collector Engine sends this event when the persistent process connector detects its controlled process has died.

Tag	Value
Severity	5
Event Name	PersistentProcessDied
Resource	AgentManager
SubResource	AgentManager

Message	Persistent Process on port <port id> has died.
---------	--

Persistent Process Restarted

Collector Engine sends this event when the persistent process connector is able to restart the controlled process that had died.

Tag	Value
Severity	1
Event Name	PersistentProcessRestarted
Resource	AgentManager
SubResource	AgentManager
Message	Persistent Process on port <port id> has restarted.

Event Service

Cyclical Dependency

Event Service sends this event when it detects a cycle in the Event Definition (in dependencies among tags due to referential map assignments). Check the event configuration in SDM and resolve the dependency.

Tag	Value
Severity	5
Event Name	CyclicalDependency
Resource	EventService
SubResource	ObjectAttrInfos
Message	Cyclical dependency detected in event transformations. Check event configuration.

Active Views

Active View Created

DAS_Binary sends this event when an Active View is 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.

Active View Joined

DAS_Binary sends this event when a user connects to an existing Active View.

Tag	Value
Severity	1
Event Name	RtChartJoiningExistingData
Resource	RealTimeSummaryService

Tag	Value
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.

Idle Active View Removed

DAS_Binary sends this event when a non-permanent Active View is removed due to inactivity.

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.

Idle Permanent Active View Removed

DAS_Binary sends this event when a permanent Active View is removed due to inactivity. Permanent Active Views are ones saved in user preferences and timeout after several days of inactivity by default.

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.

Active View Now Permanent

DAS_Binary sends this event when it detects an Active View as newly permanent. This check happens periodically, so it may be several minutes after an Active View is saved to preferences before this event is generated.

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.

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 may be several minutes after an Active View is removed from preferences before this event is generated.

Tag	Value
Severity	1
Event Name	RtChartNotPermanent
Resource	RealTimeSummaryService
SubResource	ChartManager
Message	Active View with filter <filter> and attribute <attribute> for users with security filter <security filter> is no longer permanent.

Summary

Event Name	Severity	Source	SubResource	Component
AuthenticationFailed	4	UserAuthentication	Authenticate	Authentication
NoSuchUser	4	UserAuthentication	Authenticate	Authentication
TooManyActiveUsers	4	UserAuthentication	Authenticate	Authentication
LockedUser	4	UserAuthentication	Authenticate	Authentication
UserLoggedOut	1	UserSessionManager	User	User Session
UserLoggedIn	1	UserSessionManager	User	User
UserLoggedIn	1	UserSessionManager	User	User
MoveArchiveFileFailed	3	<i>DAS Name</i>	ArchiveFile	Event
InsertEventsFailed	5	EventSubSystem	Events	Event
OpenArchiveFileFailed	3	<i>DAS Name</i>	ArchiveFile	Event
WriteArchiveFileFailed	3	<i>DAS Name</i>	ArchiveFile	Event
SummaryUpdateFailure	4	Aggregation	Summary	Aggregation
InsertIntoOverflowPartition	5	EventSubSystem	Events	Event
EventInsertionIsBlocked	4	EventSubSystem	Events	Event
EventInsertionResumed	2	EventSubSystem	Events	Event
EventRouterIsRunning	1	AgentManager	EventRouter	EventRouter
EventRouterInitializing	1	AgentManager	EventRouter	EventRouter
EventRouterStopping	2	AgentManager	EventRouter	EventRouter
EventRouterTerminating	2	AgentManager	EventRouter	EventRouter
ErrorNoSuchMap	4	MappingService	ReferentialDataObjectMap	Mapping
LoadingMapFromCache	1	MappingService	ReferentialDataObjectMap	Mapping
RefreshingMapFromServer	1	MappingService	ReferentialDataObjectMap	Mapping
TimeoutRefreshingMapData	4	MappingService	ReferentialDataObjectMap	Mapping
ErrorRefreshingMapData	4	MappingService	ReferentialDataObjectMap	Mapping
LoadedLargeMap	0	MappingService	ReferentialDataObjectMap	Mapping
LongTimeToLoadMap	0	MappingService	ReferentialDataObjectMap	Mapping
TimedoutWaitingForCallback	2	MappingService	ReferentialDataObjectMap	Mapping
ErrorApplyingIncrementalUpdat	4	MappingService	ReferentialDataObjectMap	Mapping

Event Name	Severity	Source	SubResource	Component
e				
OutOfSyncDetected	2	MappingService	ReferentialDataObjectMap	Mapping
EngineRunning	1	CorrelationEngine	CorrelationEngine	
EngineStopped	1	CorrelationEngine	CorrelationEngine	
DeploymentStarted	1	CorrelationEngine	Deployment	
DeploymentStopped	1	CorrelationEngine	Deployment	
DeploymentModified	1	CorrelationEngine	Deployment	
ProcessStart	1	WatchDog	Process	
ProcessStop	1/5	WatchDog	Process	
ProcessStart	1	WatchDog	WatchDog	
ProcessStop	5	WatchDog	WatchDog	
PortStart		AgentManager	AgentManager	
PortStop		AgentManager	AgentManager	
PersistentProcessDied	5	AgentManager	AgentManager	
PersistentProcessRestarted	1	AgentManager	AgentManager	
SortDependencies	5	EventService	ObjectAttrInfo	EventService
DbSpaceReachedTimeThrshld	0	Database	Database	Event
DbSpaceReachedPercentThrshld	0	Database	Database	Event
DbSpaceVeryLow	5	Database	Database	Event
RtChartCreated	1	RealTimeSummaryService	ChartManager	Active Views
RtChartJoiningExistingData	1	RealTimeSummaryService	ChartManager	Active Views
RtChartInactiveAndRemoved	1	RealTimeSummaryService	ChartManager	Active Views
RtChartPermanentAndRemoved	1	RealTimeSummaryService	ChartManager	Active Views
RtChartIsNowPermanent	1	RealTimeSummaryService	ChartManager	Active Views
RtChartNotPermanent	1	RealTimeSummaryService	ChartManager	Active Views