## Contents

*Accessibility Features of the SAS Social Network Analysis Server* … v

### Chapter 1 • Introduction

- Solution Overview ................................................................. 1
- Purpose of This Document .................................................. 2
- Target Audience ................................................................. 3
- Social Network Analysis Terms and Concepts ......................... 3
- Supported Investigation Methods ........................................... 5
- Related Documents ............................................................... 6

### Chapter 2 • Investigator Interface Access and Description

- Functionality Overview .......................................................... 7
- Access the SAS Social Network Analysis Server ....................... 9
- Toolbars, Windows, and Panels ............................................. 13
- Printing from the Interface ................................................... 52
- Search and Filter Features .................................................... 55

### Chapter 3 • Interface Customization and Alert Management and Disposition

- Alert Investigation Process Overview .................................... 60
- Specifying Preferences ........................................................ 60
- Search and Filter Alerts ....................................................... 64
- Investigate Alerts ............................................................... 70
- Comment Alerts ................................................................. 75
- Determining the Disposition of Alerts .................................... 79

### Chapter 4 • Social Network Analysis

- Examining and Manipulating the Social Network Analysis Diagram 84
- Exploring and Managing Nodes ............................................. 95

*Index* ................................................................................. 109
Accessibility Features of the SAS Social Network Analysis Server

Overview

For information about the accessibility of any of the products mentioned in this document, see the documentation for that product.

The SAS Social Network Analysis Server has been tested with assistive technology tools. It includes accessibility and compatibility features that improve the usability of the product for users with disabilities, with exceptions noted below. These features are related to accessibility standards for electronic information technology that were adopted by the U.S. Government under Section 508 of the U.S. Rehabilitation Act of 1973 (2008 draft proposal initiative update). Applications are also tested against Web Content Accessibility Guidelines (WCAG) 2.0, part of the Web Accessibility Initiative (WAI) of the Worldwide Web Consortium (W3C). For detailed information about the accessibility of this product, send e-mail to accessibility@sas.com or call SAS Technical Support.

Keyboard Shortcuts

The following table contains the keyboard shortcuts for the application.
### Task

<table>
<thead>
<tr>
<th>Task</th>
<th>Keyboard Shortcut</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zoom in</td>
<td>Ctrl++</td>
</tr>
<tr>
<td>Zoom out</td>
<td>Ctrl+-</td>
</tr>
<tr>
<td>Reset zoom state</td>
<td>Ctrl+0</td>
</tr>
</tbody>
</table>

### Exceptions to Accessibility Standards

These exceptions are known to occur when using the application.

<table>
<thead>
<tr>
<th>Accessibility Issue</th>
<th>Workaround</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is no visual indication of focus.</td>
<td></td>
</tr>
<tr>
<td>The toolbar in the Filters panel receives focus when the panel is collapsed.</td>
<td></td>
</tr>
<tr>
<td>In Microsoft Internet Explorer version 9, the Disposition menu cannot be reached by</td>
<td>The mouse can be used to access these items.</td>
</tr>
<tr>
<td>keyboard only. It might also appear unavailable even when an alert is selected.</td>
<td></td>
</tr>
<tr>
<td>There is no method provided to open an alert with the keyboard only.</td>
<td>Use the mouse to open the alert.</td>
</tr>
<tr>
<td>The Next and Previous page links under alerts receive focus when they are unavailable.</td>
<td></td>
</tr>
<tr>
<td>When High Contrast mode is enabled, some items might be cut off.</td>
<td>If the user selects an alert and then presses the Back to Alerts button, everything will be fully visible.</td>
</tr>
<tr>
<td>Accessibility Issue</td>
<td>Workaround</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>When Mozilla Firefox is used in High Contrast mode, some text boxes lack a visual outline, even though they are still usable.</td>
<td>Try to use the items within the tab to determine which tab is active. This works only for experienced users or when content matches the tab name.</td>
</tr>
<tr>
<td>In High Contrast mode, there is no visual indication of which tab is active.</td>
<td>Try to use the items within the tab to determine which tab is active. This works only for experienced users or when content matches the tab name.</td>
</tr>
<tr>
<td>Some icons do not accept High Contrast mode settings and are not visible when High Contrast mode is enabled.</td>
<td></td>
</tr>
<tr>
<td>Screen readers might read extraneous information when using Microsoft Internet Explorer.</td>
<td></td>
</tr>
<tr>
<td>When the advanced search feature is used with Microsoft Internet Explorer, JAWS reads &quot;[x]&quot; after each of the tabs and does not correctly read the items within each tab. When the advanced search feature is used with Mozilla Firefox, JAWS does not correctly read the items within each tab.</td>
<td>Although the items underneath each tab do not appear to be in a table, there is a table there. JAWS table-reading commands can be used to identify items within the tabs.</td>
</tr>
<tr>
<td>For items that can be expanded or collapsed in the Filters panel, JAWS does not read the information available after the item is expanded.</td>
<td></td>
</tr>
</tbody>
</table>
Solution Overview

The SAS Social Network Analysis Server 3.1 is a flexible solution that is used to help detect fraud and identify predictive behavior that might lead to fraudulent activities. The functionality of the SAS Social Network Analysis Server 3.1 is surfaced through an investigator interface and an administrator interface.
Administrators are responsible for creating projects and setting up alert routing based on specifications provided. Investigators access the investigator interface to manage, triage, and determine the disposition of alerts that have been routed to them.

Purpose of This Document

This document is the investigator guide for the SAS Social Network Analysis Server 3.1.

Note: Each deployment of the SAS Social Network Analysis Server is configured to meet the needs of a specific customer. The information and windows, including the color and layout themes, shown in this document are from demonstration projects that SAS developed to show the functionality of the SAS Social Network Analysis Server and are only examples.

All options, such as alert status designations, node colors and meanings, and types of charts, are defined and provided in advance by the report that is authored by a business analyst. Configuration options and custom stored processes are discussed in the companion guide, *SAS Social Network Analysis Server: Administration Guide*. 
**Target Audience**

The target audience for this document is the investigator. Investigators use the SAS Social Network Analysis Server to review and manage alerts that are generated to help detect or prevent fraud. The social network analysis diagram that is created automatically from the back-end data enables investigators to review associations related to an alert.

Using the information in this document, investigators use the SAS Social Network Analysis Server to do the following:

- drill from entities into details
- review the details of an alert
- perform management and review tasks of the social network analysis diagram, including the following:
  - view, annotate, edit, and rearrange network nodes
  - connect entities with links and add new nodes and links to the social network
  - save modified social network analysis diagrams for later recall and continued management
- respond appropriately to alerts, including possible referral to case management
- create and print custom views from different areas of the interface

---

**Social Network Analysis Terms and Concepts**

Efficient use of the investigator interface of the SAS Social Network Analysis Server relies on knowledge of the terms and concepts associated with alert generation and management.
The process of alert creation depends on the evolution of an entity. An entity can be defined as any object (for example, a person, a facility, a claim) or action (for example, a medical procedure, a bank deposit) for which a fraud detection script can be written and executed. The SAS Social Network Analysis Server monitors entities and generates an alert if a trigger condition is detected.

After a trigger condition is detected, the item is displayed in the interface if (a) there are no instructions in the system to have the alert suppressed and (b) there are no other flags to cause the alert not to be displayed. This item is considered an alerted entity.

An alerted entity might or might not be an entity upon which a disposition action needs to occur. For example, if a physician prescribes an uncommon medication for a condition that this type of medication is not generally used for, an alert might be generated. This initial alert might be triggered by meeting the criteria of a scripted fraud scenario, but it would not be considered an actionable entity alert, because there are many sanctioned off-label uses for medications that are not areas for concern.

As the system continues to receive data, it aggregates alerted entities. If a series of alerted entities reaches a predefined alert trigger-level, the system might get additional information about the alerted entity (for example, sixteen instances of orders for off-label use of uncommon medications prescribed by a single physician in a two-day period) and escalate the alerted entity to an actionable entity alert. In this example, the actionable entity (that is, the entity upon which an investigation would occur) is the physician.

In a typical configuration, the actionable entity alert is displayed in the Alerts window in the investigator interface. The alerted entities are displayed, generally in a Related Alerts tab in the Details window, to provide context for the actionable entity alert. The following diagram shows the relationship and evolution of alerts and entities.
**Display 1.1  Diagram of Entity Analysis through Actionable Entity Stages**

It is worth noting that not all alerted entities are escalated to actionable entity alerts, and not all actionable entity alerts have related entity alerts.

**Supported Investigation Methods**

Fraud investigations can be conducted from the bottom up or from the top down. In the bottom-up approach, a single entity (such as a claim or an account) is alerted. A social network analysis diagram, composed of nodes, surrounds the entity and is usually one or two links deep. Investigators explore the social network by expanding the linked nodes.

In the top-down approach, no individual entity is necessarily alerted. Instead, the network, being the highest-level entity, is alerted because the associations among multiple entities of various types (such as claims, claimants, and providers) collectively are suspicious. Networks are treated as single entities and are analyzed and displayed in their entirety.
Related Documents

Other documents related to the SAS Social Network Analysis Server include the following:

- **SAS Social Network Analysis Server: Administration Guide**
  The target audience for this document are business analysts and scenario administrators. The document contains information related to the administration and scenario development for the SAS Social Network Analysis Server and the SAS Financial Crimes Monitor.

- **SAS Social Network Analysis Server: Installation and Configuration Guide**
  This document provides installation and configuration information, including post-installation and migration guidance, for the SAS Social Network Analysis Server and the SAS Financial Crimes Monitor. The target audience for this document includes SAS administrators, database administrators, and system administrators using the SAS Social Network Analysis Server or the SAS Financial Crimes Monitor.
Functionality Overview

This section provides information about accessing the investigator interface and describes the functionality of the SAS Social Network Analysis Server 3.1 as it applies to the typical investigator’s role of managing and triaging alerts and of interacting with the social network analysis diagram.

Even though the investigator user interface for the SAS Social Network Analysis Server is configurable, some of the user interface features are common for most deployments.
This section describes the components of the interface. Detailed information for performing tasks can be found in “Interface Customization and Alert Management and Disposition” on page 60 and “Social Network Analysis” on page 84.

In general, an investigator uses the SAS Social Network Analysis Server investigator interface to view alerts and to determine the disposition of an alert as either requiring no action or requiring further investigation. In addition, the investigator can access the social network analysis diagram to learn more about the entity relationships and to add nodes, links, and annotations to refine the diagram. The following actions are routinely performed for investigating alerts:

- Log on.
- Select an alert series to investigate.
- (Optional) Modify preferences to be consistent with how you use the SAS Social Network Analysis Server.
- Search and filter alerts to identify the alerts of interest.
- Investigate each alert by performing the following actions:
  - Review the alert details.
  - Review transactions that are related to the alert.
  - Review charts and graphs that provide information about the entity under investigation.
  - Review the social network analysis diagram that shows the alerted entity and related entities and links.
  - Rearrange nodes and links to organize the view in a desired layout. This layout can be saved and later retrieved from the database for further analysis. Also, if the updated diagram is no longer needed, you can open the original (pre-modified) diagram instead.
  - If they are needed and if the Comment Manager is configured, review and add comments to an alert or to a node.
If they are needed, add nodes, links, and annotations to a social network analysis diagram. These modifications can be saved and later retrieved for continued review and updates.

Determine the disposition of the alert as requiring no additional investigation, or indicate that further investigation is required, such as opening a case.

During alert investigation, you can create a customized print view of the Alerts window and the Details window, and you can configure the network diagram and print a customized snapshot of the view as well.

Access the SAS Social Network Analysis Server

The SAS Social Network Analysis Server is a web application. Contact your SAS administrator for the web address and specifications for the browser (including version, operating mode, and so on) to use.

Investigators are granted access based on the user privileges that are controlled through user authorization. Logon selections are fully configurable, based on user requirements.

The following display shows an example logon window for the SAS Social Network Analysis Server user interface.
Logon windows are customized according to a specific business domain. Investigators might be prompted on logon to access a specific alert series.

To log on to the investigator interface, at the logon window:

1. Provide a user ID.
2. Provide a password.
3. Click **Log On**.

Upon successful logon, if your user ID is associated with more than one area of alert series investigation, then you are prompted to select a specific alert series. The following display shows a sample prompt.
If you are prompted, click the alert series to investigate and click **Open** to continue to the alert series.

**Note:** Because each deployment is unique, your logon sequence for a specific alert series might include an Advanced Search window that enables you to specify criteria for an alert listing. If you are prompted, execute or cancel out of the advanced search, as appropriate.

The Alerts window appears. This window, often referred to as the Alerts Report window, is customized for each deployment. In many instances, it displays the alerts that you are authorized to view within the specific domain. In other deployments, it might contain a list of entities for which alerts have been generated. In addition, the window might display a populated **Filters** panel along with an active **Disposition** menu.

The following display shows a sample Alerts window displaying two alerts.
Display 2.3  Alerts Window with Alerts Displayed

The following display shows a sample Alerts window displaying entities for which alerts have been generated.

Display 2.4  Alerts Window with Entities Displayed
If you are operating in a Microsoft Windows environment, using one of the more recent versions of Microsoft Internet Explorer, you cannot rely on the locale settings of the browser to control the interface language displayed. If you encounter issues where the interface is not displaying the language setting as expected, or if areas of the interface do not display the expected language, you might have to update the operating system language settings to remedy the issue. This is generally accomplished through the **Keyboard and Languages** tab of the Region and Language window, often accessible through the **Control Panel**.

Consult your operating system documentation for instructions for changing the input language for your system.

---

**Toolbars, Windows, and Panels**

The interface used by investigators to manage and review alerts is divided into regions that are consistent with the method in which typical tasks are performed.

**Main Toolbars**

The main toolbars are found at the top of the window in and beneath the banner area. The toolbars are always visible, but might change to present only those options that can be performed in a specific interface view.
A standard set of buttons, representing functions, is included with a base deployment, but the toolbars for your instance can differ from the one pictured in Display 2.5 on page 14, depending on the features implemented. For example, if an advanced search is not implemented for the alert series, then the **Advanced Search** button is grayed out and inaccessible.

### Table 2.1  Main Toolbars Button and Menu Items

<table>
<thead>
<tr>
<th>Toolbar Item</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Log Off Button" /></td>
<td><strong>Log Off</strong> Button</td>
<td>Enables you to log off from the SAS Social Network Analysis Server and return to the Log On window.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note:</strong> Place your mouse pointer over the <strong>Log Off</strong> button to view a tooltip displaying the name of the logged-in user.</td>
</tr>
<tr>
<td><img src="image" alt="Alert Series Menu" /></td>
<td><strong>Alert Series</strong> Menu</td>
<td>If you are granted access to more than one alert series, enables you to select a new alert series from the drop-down menu.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note:</strong> Place your mouse pointer over the <strong>Alert Series</strong> menu to view a tooltip displaying the current alert series.</td>
</tr>
<tr>
<td>Toolbar Item</td>
<td>Name</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><img src="image" alt="Help" /></td>
<td>Help Menu</td>
<td>Provides access to help resources and information about this version of the SAS Social Network Analysis Server.</td>
</tr>
<tr>
<td><img src="image" alt="Disposition" /></td>
<td>Disposition Menu</td>
<td>Functional for users (when an appropriate alert is selected) who are granted permission to determine the disposition of alerts.</td>
</tr>
<tr>
<td> </td>
<td><strong>Note:</strong> The selections for the Disposition menu are completely customizable and differ for each deployment location.</td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Back To Alerts" /></td>
<td>Back to Alerts Button</td>
<td>Available from windows other than the Alerts window, enables you to return to the Alerts window.</td>
</tr>
<tr>
<td><img src="image" alt="Search" /></td>
<td>Search Field</td>
<td>A window-specific search field. Searches tabular data and displays results that are consistent with the search criteria. At the SAS Social Network Analysis tab, entities matching the search criteria are highlighted in the diagram in addition to displaying tabular data matches.</td>
</tr>
<tr>
<td><img src="image" alt="Refresh" /></td>
<td>Refresh Button</td>
<td>Reloads the solution, returning to the Alerts window, and restores many default session settings.</td>
</tr>
<tr>
<td><img src="image" alt="Print" /></td>
<td>Print Button</td>
<td>Displays the Print window to enable you to print selected items or the network diagram.</td>
</tr>
<tr>
<td><img src="image" alt="Advanced Search" /></td>
<td>Advanced Search Button</td>
<td>If configured by your administrator, launches a custom Advanced Search window to enable you to locate alerts with the criteria indicated.</td>
</tr>
<tr>
<td><img src="image" alt="Preferences" /></td>
<td>Preferences Button</td>
<td>Opens the User Preferences window to enable you to specify and save a set of preferences for this alert series.</td>
</tr>
<tr>
<td><img src="image" alt="External Apps" /></td>
<td>External Apps Button</td>
<td>If configured by your administrator, displays a drop-down menu with external applications listed. Clicking the name of an external application opens that application in a new browser window or a new browser tab.</td>
</tr>
</tbody>
</table>
Disposition Menu

The **Disposition** menu, displayed in the toolbar area, contains the list of valid disposition methods that can be implemented in the current view. Depending on how your deployment is configured, the selection items displayed at the **Disposition** menu might differ in different sections of the interface (for example, in the Alerts window view as opposed to the Details (**Details** tab or **SAS Social Network Analysis** tab) window view).

If you are not authorized to determine the disposition of alerts, the **Disposition** menu is not enabled in any view of your alert series.

**Note:** The check box of at least one alert must be selected to enable selection of the **Disposition** menu items.

**Table 2.2  Disposition Menu States**

<table>
<thead>
<tr>
<th>Both menu items valid for the selected item in the current view.</th>
<th>Only one item, <strong>Close Alert</strong>, valid for the selected item in the current view.</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="Image" alt="Disposition menu example" /></td>
<td><img src="Image" alt="Disposition menu example" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No item selected.</th>
<th>Disposition not configured or not valid in the current view.</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="Image" alt="Disposition menu example" /></td>
<td><img src="Image" alt="Disposition menu example" /></td>
</tr>
</tbody>
</table>

Administrators might configure the deployment to disallow a certain disposition type if more than one item is selected. In that instance, you have to select the check box of just a single row item from the interface to be able to select that disposition type.
Display 2.6  View of an Alert Disposition Window Launched from the Disposition Menu

Alerts Window

Alerts Panel

The view that is displayed by default when the solution is accessed is the Alerts window (or the Alerts Report window). When this window is not displayed, it can be retrieved by clicking Back To Alerts in the main toolbar.

Display 2.7  Menu Item, Back to Alerts, Displayed at the Details Window

In a typical deployment, the Alerts window contains a collapsible Filters panel and an Alerts (display) panel composed of columns and rows.
The rows displayed at the Alerts window (assuming that the display is not filtered) are contingent upon the setup and configuration performed by your administrator as well as permissions associated with the credentials of the user that is logged on. Generally speaking, each row represents an item (entity or alert) that requires additional review and subsequent action.

**Display 2.8  View of the Alerts Panel on the Alerts Window**

![Alerts Panel](image)

The specific columns that are displayed are dependent upon the system configuration and setup. Many aspects of the Alerts panel of the Alerts window are configurable.

The content displayed in the Alerts window varies according to the following:

- alert series
- user credentials

The Alerts window might be filtered for the investigator and arranged in ascending order based on the first column. However, this is a configurable option, and it might not be the case for each deployment.

To manage the view and access alert details:
- Sort alerts by clicking a column heading.
  The alerts reorder in ascending or descending order based on the column each time the column heading is clicked.

- Change the column width by dragging the vertical divider either left or right to increase or decrease the width of the column.

- Indicate which columns to hide or display by clicking the Column Selector icon ( ) and choosing the desired column names. A cleared check box indicates that the column will not be displayed in this view.

Note: The column selector choices are valid for the current session and in the current alert series. This means that when you log off and then log back on to the current alert series, the displayed columns reflect the default settings and not your custom settings.

Note: The column selector choices at the Alerts window might be applied to a new alert series if you switch series instead of logging off and then choosing a new series. If you switch series and find that the column selector choices are being applied to the new series, then log off and log on again to display the default columns.

- Control the alerts displayed as follows:
  - Use the Jump-to page numbers at the bottom of the display (available if needed) to advance to a new page.
  - Use the Number of alerts to display per page selector at the bottom of the page to display more or fewer alerts in the current view.
To view details about an alert or entity, click the alert or entity row to access the Details window.

A set of rules determines the time-to-live for each actionable entity alert presented. Here is a summary of these rules:

- All alerts remain displayed until an action is taken.
- When a user session ends and then resumes, the alerts to which a disposition has been applied remain visible, showing the current status, until and unless the final disposition (for example, Close) is applied.  
  
  **Note:** The final disposition status is configurable and is deployment specific.

- If a second user logs on to an alert series after the first user has applied a disposition to alerts, the second user sees the alerts and their current status, excluding any alerts that the first user set to the final disposition state. The final disposition status is configurable and is deployment specific.

- After a final disposition has been applied to an alert, generally it cannot be recalled to the Alerts window through the interface.

- If a case management system is used, alerts that have been escalated for case management can be accessed through the case management system.

**Filters Panel**

If the **Filters** panel is available in your deployment, it is generally collapsed by default and is displayed to the left of the **Alerts** panel. The **Filters** panel content is unique to each deployed instance and might or might not contain active filters.
In the preceding display, Filters panel A shows the typical default status of the filters within the panel, and Filters panel B shows the same panel with the filter options expanded. Select an item or specify a filter term in the Filters panel to reduce the number of items that appear in the Alerts panel. In the following display, for example, only the alerts that have an Alert Status value of Determined are shown. In addition, the
control buttons (▼ ▲ ▼ ▶) provide a means by which to further control the filter parameters. See “Filter Preferences” on page 63.

Display 2.10  Filtered Alerts Panel Example

The Filters panel is expanded by clicking the Expand Panel button (›) at the top of the panel and is collapsed by clicking the Collapse Panel button (‹) at the top of the panel.

The filter criteria are configurable and are controlled by subject matter experts in the business domain of interest.

Details Window

Overview

The Details window is specific to the row clicked (generally an alert or an entity) at the Alerts window. This Details window is configurable and might be displayed much differently in your interface. The standard Details window is divided into three sections. Each section has one or more tabbed panels available for access.
The panels shown in the preceding figure, each completely configurable, are described as follows:

**Table 2.3  Details Window Panels**

<table>
<thead>
<tr>
<th>Panel</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Details tab</strong></td>
<td>Can contain detailed information about the actionable entity alert or about the selected alerted entity that is generally viewable in the <em>Related Information</em> panel. The content of the <strong>Details</strong> tab is configurable and might contain links to other information. For additional information about the <strong>Details</strong> tab, see “Details Tab” on page 24.</td>
</tr>
<tr>
<td><strong>B. Entity Profile panel</strong></td>
<td>Typically, shows graphs and graphics related to an alerted entity or an actionable entity and might contain additional tabs to help explain the information collected about the entity. In general, information that can be considered profile information can be found in this area. For additional information about the <strong>Entity Profile</strong> panel, see “Entity Profile Panel” on page 25.</td>
</tr>
</tbody>
</table>
The Related Information panel generally contains a Related Alerts tab. Other tabs, customized for your deployment, might also be found in this area. In general, information related to the specific alerted entity might be highlighted in this area. For additional information about the Related Information panel, see “Related Information Panel” on page 26.

Each panel area is separated from the others by a vertical or by a horizontal resize handle. Drag the handle left or right or up or down to resize the desired panel.

Details Tab

The Details tab is a standard feature, but its content is customizable. For example, depending on how the SAS Social Network Analysis Server is configured, the Details tab can display targeted information about the actionable alert or the selected alert or entity, or it can be blank. If it is populated, it might include hyperlinks to websites, documents, maps, and so on. An example appears in the following display.

Display 2.12  Example Details Tab

Information displayed in the Details tab is Read-Only. That is, it cannot be changed through the tab and is updated based on data within the system.

Note: Although the SAS Social Network Analysis tab is a standard tab found in the Details window, it can be hidden by administrators during setup and configuration of the
deployment. When available, this tab provides access to the social network analysis diagram. The diagram is a graphical representation of the items that make up the social network and their relationships to one another. Social network analysis diagrams are configurable and are different for each instance of the solution deployed.

**Entity Profile Panel**

The **Entity Profile** panel of the Details window is configurable and is based on customer requirements. Typically, this panel contains graphs and graphics that relate to the actionable entity selected from the Alerts window. In addition, if configured for your deployment, the Comment Manager might be displayed in this panel. The quantity and types of the graphs, as well as their content, vary according to the selected alert. Investigators cannot add or delete tabs in this area.

In addition, tabs in the **Entity Profile** panel have the following features:

- Placing the mouse pointer over the bars and lines of a graph reveals the underlying data points and categories of association.
- When more than one item is displayed on a panel, move the vertical resize ( salarié ) handle to expand or contract each graph.
- When multiple items are present and the total width of the items exceeds the horizontal space allocated for display, additional controls are presented to enable navigation between and selection of the items. Here is an example showing scroll controls ( A and B ) and a list control ( C ).

  □ To scroll through the selection of tabs, click the scroll controls and then select the tab name desired.

  □ To jump directly to a tab, click the list control to display a list of available tabs and then select a tab name from the list.

- The entire **Entity Profile** panel can be opened in a floating window by selecting the **Open Window** ( salarié ) button at the top right of the **Entity Profile** panel . The following display shows the location of the **Open Window** button and shows an example of the floating window that opens.
Selecting the **Previous** and **Next** buttons in the floating window steps through any other tabbed content displayed in the **Entity Profile** area.

**Related Information Panel**

The tabs on the **Related Information** panel at the bottom of the alert Details window show information that is related to the selected alert or entity. That is, the items that are listed are usually the discrete alerted entities that make up the alerted actionable entity displayed at the Alerts window. Each row represents an individual scenario that triggered the alert in question. Other tabs, customized for your deployment, might also be found in this area.

Most deployments include a tab that is named **Related Alerts**. The other tabs vary according to the business domain of interest. Related alerts are triggered based on the business rule and predictive models that are run at the various sub-entity levels.

In addition, tabs in the **Related Information** panel have the following features:

- When multiple items are present and the total width of the items exceeds the horizontal space allocated for display, additional controls are presented to enable
navigation between and selection of the items. Here is an example showing scroll controls (A and B) and a list control (C).

- To scroll through the selection of tabs, click the scroll controls and then select the tab name desired.
- To jump directly to a tab, click the list control to display a list of available tabs and then select a tab name from the list.

- Sort by clicking a column heading.
  The information reorders in ascending or descending order based on the column each time the column heading is clicked.

- Change the column width by dragging the vertical divider either left or right to increase or decrease the width of the column.

- Indicate which columns to hide or display by clicking the Column Selector icon ( ) and choosing the desired column names. A cleared check box indicates that the column will not be displayed in this view.

Note: The column selector choices are valid for the current session and in the current alert series. This means that when you log off and then log back on to the current alert series, the displayed columns reflect the default settings and not your custom settings.

- Control the alerts displayed as follows:
  - Use the Jump-to page numbers at the bottom of the display (available if needed) to advance to a new page.
Use the **Number of alerts to display per page** selector at the bottom of the page to display more or fewer alerts in the current view.

---

**Social Network Analysis Diagram**

**Overview of Diagram Features**

The social network analysis diagram enables you to view and manage the relationships associated with the currently selected alert. By default, the diagram is accessible by selecting the **SAS Social Network Analysis** tab from the Details window. The **SAS Social Network Analysis** tab is divided into several seamless regions with functionality to enable you to perform all necessary tasks.
Display 2.14  Example of a SAS Social Network Analysis Diagram

Table 2.4  SAS Social Network Analysis Tab Sections

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
</table>
| A. Filters (network highlighting) panel | If configured for your deployment, the Filters panel of the SAS Social Network Analysis diagram enables you to highlight the nodes meeting the indicated filter criteria.  

The Filters panel is expanded by clicking the Expand Panel button (↑) at the top of the panel and is collapsed by clicking the Collapse Panel button (↓) at the top of the panel.  

For additional information, see “Social Network Filters Panel – Network Highlighting” on page 31. |
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Social network analysis toolbar</td>
<td>The social network analysis toolbar is configurable for each deployment instance. Your instance might not appear the same as the one in the preceding figure or allow execution of all features described in this document. In general, the toolbar enables you to refine the diagram (by adding node and links or editing existing nodes and links) and to manipulate the view for optimized presentation. For additional information, see “SAS Social Network Analysis Diagram Toolbar” on page 36.</td>
</tr>
<tr>
<td>C. Nodes, links, and relationships</td>
<td>The nodes and entity relationships are viewable in the social network analysis diagram. The social network analysis diagram represents the relationship of the entities in the currently selected alert. The look and many of the characteristics of this diagram can be controlled or modified using the toolbar. The icons that represent the diagram are customizable and might not resemble the diagrams displayed in this guide. For additional information, see “Nodes, Links, and Relationships” on page 38.</td>
</tr>
<tr>
<td>D. Properties panel</td>
<td>The Properties panel is displayed to the right of the social network diagram. It is collapsed by default and can be expanded by clicking the Expand Panel button (↵) at the top of the panel. It is collapsed by clicking the Collapse Panel button (↗) at the top of the panel. When the Properties panel is expanded, it displays information about a selected node, link, or group. It is also through the Properties panel that node annotations and link labels can be added or edited. The Properties panel also enables you to expand the Show Details panel at the bottom of the window to display details about a selected node. For additional information, see “Properties Panel” on page 46.</td>
</tr>
<tr>
<td>E. Time and scope controller</td>
<td>If your solution is configured for this functionality, the time and scope view can be controlled by using the time slider, the jump-to functionality, and the Cumulative and Marginal buttons found at the bottom of the diagram. Note: For detailed information about the use and advantages of cumulative versus marginal views of the social network analysis diagram, refer to “Time and Scope Controller” on page 48.</td>
</tr>
</tbody>
</table>


### Feature Description

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F. Show Details panel</strong></td>
<td>The <strong>Show Details</strong> panel, not shown in Display 2.14 on page 29, can be displayed beneath the time and scope controller. This area is configured by the administrator and is completely customizable. The <strong>Show Details</strong> panel can display the Comment Manager as well as tables and graphs specific to the social network analysis diagram. For additional information, see “Show Details Panel” on page 50.</td>
</tr>
</tbody>
</table>

**Social Network Filters Panel – Network Highlighting**

If configured for your deployment, you can use the **Filters** panel at the **SAS Social Network Analysis** tab to view highlighted nodes and paths indicative of the filter criteria. With the network highlighting feature, administrators can design and implement network graphing functionality that highlights a trend or behavior over a period of time. This makes identifying specific incidents or entities easier and enables users to see highlighted nodes and links and to view paths between nodes based on associative behaviors.

Here are several examples displaying different aspects of network highlighting.

In **Display 2.15**, the **Filters** panel is expanded to display the configured filter criteria for the social network analysis diagram. Generally, the administrators configure the default settings to display a ‘no criteria met’ view. After the filters are populated or manipulated,
the nodes and links of the diagram are highlighted to show which items meet the indicated criteria.

Display 2.15  SAS Social Network Analysis Tab with Expanded Filters Panel
In Display 2.16, the range slider for the Overall Score filter has been adjusted to reflect a range of 0–53. As a result, the social network analysis diagram displays the appropriate nodes and links as highlighted to indicate that they meet the criteria.

**Display 2.16** SAS Social Network Analysis Tab with Filtered Overall Score Criteria Highlighted in Diagram
In **Display 2.17**, the range slider for the Overall Rank filter has been adjusted to reflect a range of 0–453. As a result, the social network analysis diagram displays the appropriate nodes and links as highlighted to indicate that they meet the criteria.

**Display 2.17** SAS Social Network Analysis Tab with Filtered Overall Rank Criteria Highlighted in Diagram

In **Display 2.18**, the range slider for the Overall Rank filter has been adjusted to reflect a range of 0–355, and the time slider, in Cumulative mode, indicates an end date of June 9, 2002. As a result, the social network analysis diagram displays the appropriate nodes and links as highlighted to indicate that they meet the criteria. The nodes that are
inactive during this time period, shown as dimmed nodes, are also highlighted if they meet the criteria.

**Display 2.18** SAS Social Network Analysis Tab with Date-Adjusted Filtered Overall Rank Criteria Highlighted in Diagram

In **Display 2.18**, the range slider for the Overall Rank filter has been adjusted to reflect a range of 0–355, and the map view has been enabled. As a result, the social network analysis diagram displays the appropriate nodes and links as highlighted, superimposed on the map, to indicate that they meet the criteria. Only nodes that have a valid longitude and latitude value are displayed on the map. Those nodes that cannot be
displayed because of non-existent or invalid longitude and latitude values are listed in the See Nodes window.

**Display 2.19**  SAS Social Network Analysis Tab with Map View and Filtered Overall Rank Criteria Highlighted in Diagram

The filters available in the **Filters** panel are customized for your deployment. If an administrator has not defined network highlighting filters, then the **Filters** panel will not display filters.

**SAS Social Network Analysis Diagram Toolbar**

The social network analysis diagram contains a button toolbar at the top of the diagram.
The toolbar is standard, and the operation associated with a button can be performed only when it is an allowable operation. For example, the **Add Node** button is always present. However, if you click the **Add Node** button before selecting a node that will be the source node for the addition, a message indicating that this is not allowed is displayed. In other instances, a button might be dimmed if the associated feature is not implemented or a task cannot be performed in this view. For example, if the Map feature is not enabled for your deployment, then the **Map** button is dimmed and inaccessible. If the Map view is enabled, when you enter the Map view, all buttons other than the **Hide Map** button are disabled.

Each button description is shown when you position your mouse pointer over the button. This guide provides additional information, as appropriate, in sections where a toolbar button can be used to execute an operation. Here is a high-level description of each toolbar button.

<table>
<thead>
<tr>
<th>Button</th>
<th>Name</th>
<th>Use and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Save Network]</td>
<td>Save Network</td>
<td>Saves the current network diagram to the database.</td>
</tr>
<tr>
<td>![Open]</td>
<td>Open</td>
<td>Selecting the down arrow (▼) next to the <strong>Open</strong> button displays selections to retrieve the original network graph (from the stored process) or the most recently modified network graph (from the database).</td>
</tr>
<tr>
<td>![Run Layout]</td>
<td>Run Layout</td>
<td>Selecting the down arrow (▼) next to the <strong>Run Layout</strong> button displays selections to enable you to choose a layout to impose on the current network diagram.</td>
</tr>
<tr>
<td>Button</td>
<td>Name</td>
<td>Use and Description</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><img src="image" alt="Add Node" /></td>
<td>Add Node</td>
<td>After an existing node is selected, enables you to add a new node.</td>
</tr>
<tr>
<td><img src="image" alt="Add Link" /></td>
<td>Add Link</td>
<td>After two nodes are selected, enables you to add a new link.</td>
</tr>
<tr>
<td><img src="image" alt="Edit Entity" /></td>
<td>Edit Entity</td>
<td>After an entity is selected, enables you to update the current entity information and specifications.</td>
</tr>
<tr>
<td><img src="image" alt="Delete Entity" /></td>
<td>Delete Entity</td>
<td>After an eligible entity is selected, enables you to delete the entity from the network view.</td>
</tr>
<tr>
<td><img src="image" alt="Group Nodes" /></td>
<td>Group Nodes</td>
<td>After eligible nodes are selected, enables you to fold the selected nodes into an individual node that represents the group.</td>
</tr>
<tr>
<td><img src="image" alt="Regroup Nodes" /></td>
<td>Regroup Nodes</td>
<td>Enables you to regroup a collection of nodes.</td>
</tr>
<tr>
<td><img src="image" alt="Collapse Expanded Nodes" /></td>
<td>Collapse Expanded Nodes</td>
<td>Enables you to collapse hidden nodes after they have been expanded.</td>
</tr>
<tr>
<td><img src="image" alt="Show Map" /></td>
<td>Show Map</td>
<td>If enabled for your alert series, displays a map in the background and superimposes all eligible nodes onto the map.</td>
</tr>
<tr>
<td><img src="image" alt="Hide Map" /></td>
<td>Hide Map</td>
<td>If a map is displayed, enables you to hide the map, while leaving the nodes and links in view.</td>
</tr>
<tr>
<td><img src="image" alt="Home" /></td>
<td>Home</td>
<td>Enables you to re-center the network diagram. In addition, selecting the down arrow (▼) next to the Home button displays options to enable you pan left, right, up, or down.</td>
</tr>
<tr>
<td><img src="image" alt="Zoom In" /></td>
<td>Zoom In</td>
<td>Enables you to zoom in on the network diagram.</td>
</tr>
<tr>
<td><img src="image" alt="Zoom Out" /></td>
<td>Zoom Out</td>
<td>Enables you to zoom out of the network diagram.</td>
</tr>
</tbody>
</table>

**Nodes, Links, and Relationships**
A social network analysis diagram consists of a series of nodes connected by links, where the nodes are entities represented by icons, and the link represents the start and
end time of entity involvement. The node icon might represent a single entity (person), a transaction (purchase), or any other relevant item.

The social network analysis diagram displays the interconnected details of a specific alert. The diagram shows the relationship between a specific entity and other related entities. The entity icons are specific to your deployment and might contain representations for items such as patients, doctors, claims, and provider.

Social network analysis diagrams are created based on the data that is available during the alert generation process. Investigators do not need to perform any tasks to create and display the social network analysis diagram.

The following figure shows a sample social network analysis diagram.

Display 2.21 Sample Social Network Analysis Diagram

An ID uniquely identifies each node and link in a social network analysis diagram. An ID is assigned to each node and link, but the IDs of entities that you add can be changed
through the Graph Entities Wizard in the interface. In contrast, a label is a non-required entry that can contain descriptive text about a particular node or a specific link and does not have to be a unique entry. The initial text in a label might be controlled by subject matter experts in the business domain of interest. Investigators can add, delete, and edit label text through the interface.

Annotations are notes attached to nodes. Investigators can use the annotation feature to add additional information to selected nodes.

**Note:** Annotations and labels are text-only entries. For example, you cannot include HTML markup in an annotation or in a label.

Links do not support the annotation feature.

Here is an example showing a selected node displaying the associated label (A) and the annotation (B).

**Display 2.22 Node Label and Node Annotation**

Here is an example showing a selected link (A) displaying the associated label (B).
**Note:** Labels, annotations, and IDs can also be managed through the Graph Entities Wizard.

New nodes and links can be added to the diagram by using the Add Node feature. Selecting an existing node and then choosing **Add Node** from the toolbar brings up the Graph Entities Wizard. The Graph Entities Wizard contains two tabs, **Add Node** and **Add Link**, and is displayed with Read-Only fields dimmed and inaccessible.
Using the **Add Node** and **Add Link** tabs of the Graph Entities Wizard, you can add nodes and links and you can customize the appearance of the added nodes and links to monitor relationships that might not be indicated in your current data source.
### Table 2.6  Node Properties

<table>
<thead>
<tr>
<th>Node Property</th>
<th>Description</th>
<th>Required?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Id</td>
<td>A series of characters used to distinguish the node. Assigned by default, but can be changed for nodes that you add through the interface. <strong>Note:</strong> By default, each node ID assigned is unique per node. If you change or create a node ID for an added node, you are encouraged to ensure that it is not a duplicate ID.</td>
<td>Yes</td>
</tr>
<tr>
<td>Label</td>
<td>Descriptive text for the node. <strong>Note:</strong> Labels can contain text only. For example, HTML markup is not supported.</td>
<td>No</td>
</tr>
<tr>
<td>Annotation</td>
<td>A comment or details for the node. Text can be modified at the <strong>Annotation</strong> text box of the <strong>Properties</strong> panel of the social network analysis diagram. <strong>Note:</strong> Annotations can contain text only. For example, HTML markup is not supported.</td>
<td>No</td>
</tr>
<tr>
<td>Border Size</td>
<td>Width of the border surrounding the node. The default is selected if border size is not indicated.</td>
<td>Yes</td>
</tr>
<tr>
<td>Latitude</td>
<td>If the node is to be displayed in the Map view, then a latitude value is required.</td>
<td>No</td>
</tr>
<tr>
<td>Longitude</td>
<td>If the node is to be displayed in the Map view, then a longitude value is required.</td>
<td>No</td>
</tr>
<tr>
<td>Node Property</td>
<td>Description</td>
<td>Required?</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Change Dates</td>
<td>The Change Dates controls enable you to specify the parameters of the node that you are adding to the social network analysis diagram.</td>
<td></td>
</tr>
</tbody>
</table>

- **Date.** Enabled after a second instance of the node is added. This field is needed only if (a) you are specifying properties for an additional instance of a single node, and (b) one or more node properties change at a specific date, indicated by this change date. Conditionally required.

- **Color.** The default is selected if a background color is not chosen. Required.

- **Border Color.** Color surrounding the node. The default is selected if a border color is not chosen. Required.

- **Icon.** A graphical representation of the node entity. Required.

For information about adding change dates, see “Adding Change Dates to Nodes” on page 106.
Table 2.7  Link Properties

<table>
<thead>
<tr>
<th>Link Property</th>
<th>Description</th>
<th>Required?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Id</td>
<td>A series of characters used to distinguish the link. Assigned by default, but can be changed for links that you add through the interface. <strong>Note:</strong> By default, each link ID assigned is unique per link. If you change or create a link ID for an added link, you are encouraged to ensure that it is not a duplicate ID.</td>
<td>Yes</td>
</tr>
<tr>
<td>To Node</td>
<td>Destination of the link. Automatically assigned based on initial selections. This cannot be changed.</td>
<td>Yes</td>
</tr>
<tr>
<td>From Node</td>
<td>Origin of the link. Automatically assigned based on initial selections. This cannot be changed.</td>
<td>Yes</td>
</tr>
<tr>
<td>Label</td>
<td>Descriptive text for the link. <strong>Note:</strong> Labels can contain text only. For example, HTML markup is not supported.</td>
<td>No</td>
</tr>
<tr>
<td>Thickness</td>
<td>Width of the link. The default is selected if the link thickness is not indicated. <strong>Note:</strong> Line widths are relative widths and are not associated with a unit of measure. This means that the width of the lines scale as the zoom-in and zoom-out feature is used, but a line width with a higher value will always appear thicker than a line width with a lower value.</td>
<td>Yes</td>
</tr>
<tr>
<td>Type</td>
<td>Links can be defined as either a standard link or a vector link. Standard links connect two nodes, while vector links point from one node to another node.</td>
<td>Yes</td>
</tr>
<tr>
<td>Start Date</td>
<td>Date upon which the link became active. If there is no start date, then select the <strong>No Start Date</strong> check box.</td>
<td>Yes</td>
</tr>
<tr>
<td>End Date</td>
<td>Date upon which the link grew inactive. If there is no end date, then select the <strong>No End Date</strong> check box.</td>
<td>Yes</td>
</tr>
<tr>
<td>Color</td>
<td>Color of the link. The default is selected if a border color is not chosen.</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Properties Panel

The Properties panel is displayed to the right of the social network analysis diagram. It is collapsed by default and can be expanded by double-clicking a node, a link, or a group. It can also be expanded by clicking the Expand Panel button (¶) at the top of the panel. It is collapsed by clicking the Collapse Panel button (¶) at the top of the panel.

When the panel is expanded, it is populated by the properties associated with a selected node, group, or link.

Display 2.25  Example of a Populated Properties Panel for a Selected Node
Display 2.26  Example of a Populated Properties Panel for a Selected Group

Here is an explanation of the regions of the Properties panel.

Table 2.8  Properties Panel Area Description

<table>
<thead>
<tr>
<th>Area</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Show Details button</td>
<td>Available when a node is selected, the Show Details button expands a Show Details panel at the bottom of the window. The Show Details panel is configured by the administrator and is customizable. If your deployment has been configured for use with the Comment Manager, then the Comment Manager is displayed in this region.</td>
</tr>
<tr>
<td>Area</td>
<td>Name</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>B</td>
<td>Node Annotation or Link Label</td>
<td>Node annotations can be viewed, edited, and added from the text area. Link labels can be viewed, edited, and added from the text area.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note:</strong> This field accepts text entries only. For example, HTML markup is not supported.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note:</strong> In the map view, new annotations cannot be added and existing annotations cannot be edited for nodes. Any additions or modifications to node annotations in the map view will not be saved.</td>
</tr>
<tr>
<td>C</td>
<td>Name:Value pair</td>
<td>The ‘Name:Value’ properties displayed for nodes and links originating from the stored process are pulled from the database (as configured by your administrator) and cannot be modified through the SAS Social Network Analysis Server interface. For nodes and links that are added to the social network analysis diagram, there are no ‘Name:Value’ properties displayed.</td>
</tr>
<tr>
<td>D</td>
<td>Node List</td>
<td>When a group is selected, nodes contained within the group are displayed in this area. You can select a node within the list and add or modify an annotation. You cannot add an annotation to the group.</td>
</tr>
</tbody>
</table>

**Time and Scope Controller**

The time and scope controller area of the social network analysis diagram provides a time line that includes a time slider to enable you to view the evolution of the network over time (or at a specific point in time). It also contains scope controls to display either a cumulative or a marginal view, and it contains a jump-to feature to enable you to move rapidly between node change dates and link start and end dates on the time line.
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope controller</td>
<td>The <strong>Cumulative</strong> and <strong>Marginal</strong> options are used to control the scope of the display.</td>
</tr>
<tr>
<td></td>
<td>- <strong>Cumulative.</strong> Provides functionality to enable viewing the entry of relationships as time progresses. This allows the full graph to be displayed when the time slider is moved all the way to the right.</td>
</tr>
<tr>
<td></td>
<td>- <strong>Marginal.</strong> Provides functionality to enable viewing the beginning and end of relationships. As the time slider moves to the right on the time line, relationships appear (start time) and disappear (end time) from the graph. The graph might not be fully displayed when the time slider is all the way to the right because some relationships (shown as links) could have ended.</td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>By default, the graph is displayed with <strong>Cumulative</strong> selected.</td>
</tr>
<tr>
<td>Time line</td>
<td>The time line represents a period of time, with the initial and end dates of the relationship shown as the start and end dates on the time line.</td>
</tr>
<tr>
<td>Time slider</td>
<td>The time slider can be moved to the left and right on the time line to allow visualization of the network as it develops over time.</td>
</tr>
<tr>
<td>Jump-to feature</td>
<td>The jump-to feature enables you to jump right (right arrow) or to jump left (left arrow) to move along the time line at intervals consistent with link start and end dates and with node change dates.</td>
</tr>
</tbody>
</table>

The time and scope features enable the investigator to visualize when nodes within the network became active or inactive. As the time slider moves from left to right or from right to left along the time line, nodes can change their transparency to indicate that they became active or inactive (depending on setting the view to marginal or cumulative) at the selected time. Nodes can also change color (or other visual properties) at time intervals. Changes to properties, such as color and transparency, are defined in a top-level report that is authored by the subject matter expert in the business domain. The investigator can also click anywhere along the time line, causing the slider to snap to the cursor position and show the network diagram at the time indicated at that location. The jump-to feature enables an investigator to click an arrow (left or right) to jump from one begin date of a link to the end date of a link.
The following figure shows a sample social network analysis diagram with the time slider set at May 11, 1998. Several nodes are active in the network at that time.

**Display 2.27  Time and Scope Controller Example**

**Show Details Panel**

The **Show Details** panel is displayed at the bottom of the social network analysis diagram when it is expanded by clicking the **Show Details** button of the **Properties** panel. It is also exposed, when a qualifying node is selected, by dragging the resize bar beneath the time and scope controller upward.
Display 2.28  Example of the Show Details Panel

Table 2.10  Item Description Related to Show Details Panel

<table>
<thead>
<tr>
<th>Item</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Show Details</td>
<td>This button is available when the selected entity is a node. Clicking the Show Details button exposes the Show Details panel beneath the time and scope controller.</td>
</tr>
<tr>
<td>B</td>
<td>Resize handle</td>
<td>Drag the resize handle up to expand the area beneath the time and scope controller, or drag the resize handle down to expand the area above the time and scope controller.</td>
</tr>
<tr>
<td>C</td>
<td>Show Details</td>
<td>The information in this area is related to the SAS Social Network Analysis entity.</td>
</tr>
</tbody>
</table>

The Show Details panel content is completely configurable, but if the Comment Manager is enabled for your deployment, it is displayed in this area of the SAS Social Network Analysis tab. See “Comment Alerts” on page 75.
Printing from the Interface

The print feature of the SAS Social Network Analysis Server enables you to print one or more areas of any of the windows in the interface. When you initiate printing, all areas of the current view are loaded in a window for printing. By indicating which areas to print, you can create a custom hard copy of the information in the display.

Here are the items for consideration when printing from the interface:

- **Alerts window**
  At the Alerts window, when you initiate printing, the Print window displays all of the row items retrieved from the database. This means that if your Alerts window shows 20 items, but 100 items make up the entire list, the Print window displays 100 items. In addition, if you have filtered the view or hidden columns, the filtered out items and the hidden columns are also displayed in the Print window.

- **Details tab of the Details window**
  At the Details tab of the Details window, when you initiate printing, the Print window displays all items in the Entity Profile panel as well as all items in the Related Information panel. The Details tab is not displayed in the Print window.

- **SAS Social Network Analysis Server tab of the Details window**
  At the SAS Social Network Analysis tab of the Details window, when you initiate printing, the social network analysis diagram is displayed in a new browser tab, the Print View, and the native browser Print window is opened.

When the Print window is displayed for the Alerts window and the Details tab of the Details window, the header area of the Print window contains a list of items matching the header of each individual item in the Print window. Deselecting items from the header list removes the item from the print view so that it is not sent to the printer. For the SAS Social Network Analysis tab, the network diagram is displayed in the Print View browser tab as it is viewed in the interface and cannot be modified in the Print View window.
Information displayed as tabular data retains the controls available in the interface. This enables you to hide rows or columns in the Print window to control the data that is sent to the printer.

Here is an example of a Print window launched from the Details window.

**Display 2.29  Example of a Print Window Launched from the Details Window**

Here is an example of a Print View browser tab launched from the SAS Social Network Analysis tab.
To print from the interface:

1. Navigate to the window or tab that you want to print.
   If you are printing the SAS Social Network Analysis tab, organize the network diagram in a manner that is consistent with what you want to see in the hard copy.

2. Click Print (⎙) from the main toolbar.
   The Print window is displayed for the Alerts window and for the Details tab. A Print View browser tab is opened for the SAS Social Network Analysis tab.

3. For all views other than the SAS Social Network Analysis tab, indicate the items to print by deselecting the items that you do not want to print. For the SAS Social Network Analysis tab, the view in the Print View window is the view that will be printed.

4. Click the Print button at the Print window for all views other than the SAS Social Network Analysis tab. The native Print window is displayed.
   For the SAS Social Network Analysis tab, the native browser Print window is displayed by default. If it has been closed, then select Print from the File menu of the browser window to display the native browser Print window.
At the native browser Print window, indicate the print specifications and click **OK** to continue.

The configured view is sent to the selected printer.

---

**Search and Filter Features**

To refine the number or type of alerts displayed, the SAS Social Network Analysis Server can provide three methods (advanced search, the **Filters** panel at the Alerts window, and text search) for narrowing the scope of the items displayed or highlighting nodes meeting the search criteria.

**Searching versus Filtering**

Advanced search is an optional feature that enables an investigator to retrieve alerts from the SAS Social Network Analysis Server based on criteria that are controlled by subject matter experts in the business domain of interest. The following display shows a
sample Advanced Search window, designed to retrieve a subset of cases as specified by the search criteria.

**Display 2.31  Advanced Search Display Window**

![Advanced Search Display Window]

The SAS Social Network Analysis Server can be configured so that the Advanced Search window is displayed automatically when you access the interface, and it can be opened anytime the **Advanced Search** button is displayed by clicking the button from the toolbar.

In deployments that have a high volume of alerts, the initial loading of the alerts in the Alerts window can reduce system performance because of the amount of data that must be read from the SAS Social Network Analysis Server, transmitted across the network, and then displayed. The advanced search feature provides a window that enables you to set criteria for the alerts that you want to view.

When the **Search** button (which might have a different name in your deployment) is clicked in the Advanced Search window, the criteria are sent from the web browser to the SAS Social Network Analysis Server. The SAS Social Network Analysis Server uses the search criteria to subset the alerts that meet the criteria and then sends only those alerts to the web browser and displays them in the Alerts window.
The **Filters** panel operates differently from the advanced search feature. After the Alerts window is populated, the **Filters** panel can be used to set criteria for the alerts that you want to be displayed. Alerts that do not meet the criteria are hidden. The criteria are determined in part by subject matter experts who determine whether an alert field should be in the criteria. If so, then check boxes are used for distinct values that are found in the alerts, sliding scales, and text fields. This filtering feature is performed in the web browser and does not require communication with the SAS Social Network Analysis Server. Refer to “Filters Panel” on page 20 for additional information.

The text search offers more flexibility for specifying the search term than either of the other two methods.

*Display 2.32  Example of Populated Text Search Area*

In general, the text search feature is used to do the following:

- reduce the number of rows (generally reflective of alerts or entities) that are visible in the Alerts window. When you type in the **Search** text box, the row items in the Alerts window display reflect the text in the **Search** text box. Only the row items that have a field with matching text or numeric values remain visible. Row items that do not match the filter expression are hidden.

- reduce the number of rows that are visible within the tabular data at the Details window. When you type in the **Search** text box, the row items in the Details workspace display reflect the text in the **Search** text box. Only the row items that have a field with matching text or numeric values remain visible. Row items that do not match the filter expression are hidden.

- highlight nodes on a social network analysis diagram (in standard or in map view). When the social network analysis diagram is viewed, you can enter text or a numeric string in the **Search** text box, and any nodes that match the filter expression are displayed with a color highlight.
reduce the number of rows that are visible within the tabular data at the **Show Details** panel of the **SAS Social Network Analysis** tab. When you type in the **Search** text box, the row items in the **Show Details** panel, if your administrator has configured the **Show Details** panel with tabular data, reflect the text in the **Search** text box. Only the row items that have a field with matching text or numeric values remain visible. Row items that do not match the filter expression are hidden.

The following table summarizes the key differences between the search and filter features.

**Table 2.11  Search and Filter Feature Comparison**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Advanced Search</th>
<th>Filter Panel</th>
<th>Text Search</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confined to selecting from a predefined set of criteria</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Relies on server communication for execution (that is, the process includes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>a round-trip call to the server resulting in a response that returns matching</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>alerts)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can use free form text as the search criteria</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Highlights results on the social network analysis diagram</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Usage information for the search and filter features can be found in “**Search and Filter Alerts**” on page 64.
Interface Customization and Alert Management and Disposition

Alert Investigation Process Overview ........................................... 60

Specifying Preferences ................................................................. 60
  Overview ............................................................................. 60
  User Preferences ................................................................. 61
  Filter Preferences ................................................................. 63

Search and Filter Alerts ................................................................. 64
  Search for Alerts with Advanced Search ................................. 64
  Filter Alerts ......................................................................... 66
  Text Search – Window Specific ............................................... 67

Investigate Alerts ......................................................................... 70
  Review the Alert Details ......................................................... 70
  Review the Related Information .............................................. 72
  Review the Entity Profile Panel ............................................... 73
  Review the Social Network Analysis Diagram ....................... 74

Comment Alerts ............................................................................ 75
  Comments Feature Overview ................................................ 75
  Adding a Comment to an Alert ............................................... 76
  Adding a Comment to a Node ................................................ 77

Determining the Disposition of Alerts ........................................... 79
Alert Investigation Process Overview

Although there is no standard procedure that fits every situation for investigating and disposing of alerts, there are several steps that are typical for the process. In general, the process includes the following:

- Set your personal preferences to enable use of the system in the most efficient manner for your operating style.
- Search and filter alerts to locate or group the alerts of interest. Alerts can also be filtered to allow viewing of an alerted entity on the social network analysis diagram (if it is configured for your deployment).
- Investigate the alert by performing a series of review steps to determine the factors that generated the alert.
- If your deployment is configured with the alerts commenting feature (Comment Manager), comment or review and update comments as needed to decide the best course of action for the alert.
- Determine the disposition of alerts as needed and as specified by the policies of your organization.

The remaining sections of this chapter discuss each avenue of alert management and disposition. Since each deployment is configured to best meet the needs of the organization, your instance might not be set up to enable you to perform all tasks as described.

Specifying Preferences

Overview

User-defined preferences are those preferences that are controlled through a User Preferences window from within the SAS Social Network Analysis Server. These
preferences are implemented per alert series and remain in effect until they are updated.

- To access the User Preferences window from within an alert series, select Preferences (_preferences) from the toolbar.

The User Preferences window is displayed, generally displaying the Tabs tab.

**Display 3.1  User Preferences Window Showing the Tabs and SAS Social Network Analysis Tabs**

The User Preferences window enables you to indicate a preference for displayed tabs at the Details window and to specify your preference for showing or hiding the default node labels of the social network analysis diagram.

**User Preferences**

**Default Tab Display**

At the Alerts window, to view details related to a row item (generally an alert or an entity), the row item must be selected (clicked). Once a row is selected, the Details
window is displayed. The Details window has two tabs, **Details** and **SAS Social Network Analysis** (if the **SAS Social Network Analysis** tab has been enabled for your deployment). Using the User Preferences options, you can indicate which tab is to be displayed by default when you access the Details window.

To access the **Tabs** tab of the User Preferences window:

1. Select **Preferences** from the toolbar and then click the **Tabs** tab.
2. Choose the desired default tab from the drop-down list.
3. After you have made your selections, click **Save** to save your options.

The new options are in effect until you update them. The options indicated are launched when you open the solution and access the alert series.

You can also click **Restore Defaults** from the **Tabs** tab of the User Preferences window to reinstate the tab specification that is configured by default.

**Note:** The option to display or hide the **SAS Social Network Analysis** tab is an administrator-configurable setting. If your deployment does not include a **SAS Social Network Analysis** tab, then do not select the **SAS Social Network Analysis** option as the default tab. Doing so will cause unpredictable results in the user interface.

**Default Node Label View**

At the Alerts window, selecting the **SAS Social Network Analysis** tab displays the social network analysis diagram. Using the User Preferences options, you can indicate the default state of node labels (either hidden or displayed).

To access the **SAS Social Network Analysis** tab of the User Preferences window:

1. Select **Preferences** from the toolbar and then click the **SAS Social Network Analysis** tab.
2. Choose the desired selection from the drop-down list.
3. After you have made your selections, click **Save** to save your options.
The new options are in effect until you update them. The options indicated are launched when you open the solution and access the alert series.

You can also click **Restore Defaults** from the **SAS Social Network Analysis** tab of the User Preferences window to reinstate the SAS Social Network Analysis specification that is configured by default.

**Note:** The option to display or hide the **SAS Social Network Analysis** tab is an administrator-configurable setting. If your deployment does not include a **SAS Social Network Analysis** tab, then do not select the **SAS Social Network Analysis** option as the default tab. Doing so will cause unpredictable results in the user interface.

**Filter Preferences**

If configured by your administrator, filter preferences are available at the Alerts window and at the **SAS Social Network Analysis** tab of the Details window. The filter preferences are controlled by a series of buttons at the top of the panel. Here are the details related to the **Filters** panel preferences.

**Table 3.1 Filter Preferences Buttons**

<table>
<thead>
<tr>
<th>Button</th>
<th>Name</th>
<th>Use and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![ ]</td>
<td>Apply Filters</td>
<td>Applies the current settings to the alerts or entities surfaced in the interface.</td>
</tr>
<tr>
<td>![ ]</td>
<td>Clear Search</td>
<td>Clears any changes made in the <strong>Filter</strong> panel during this session. User saved preferences are not affected.</td>
</tr>
<tr>
<td>![ ]</td>
<td>Save Current Filters</td>
<td>Saves the current settings as the default.</td>
</tr>
<tr>
<td>![ ]</td>
<td>Restore Filters</td>
<td>Removes any stored user filter preferences and returns all settings to the default settings.</td>
</tr>
</tbody>
</table>

Only one filter preference can be saved at a time. Saving a new filter preference replaces the stored one without warning.
Search and Filter Alerts

Searching and filtering are methods of reducing the number of displayed alerts to enable you to focus on a subset of alerts. The search and filter options that might be available in your deployment include searching with the Advanced Search window, filtering using the Filters panel, or performing a text search using the Search text box (available at each window and providing window-specific results). For details about the differences between filtering and searching, see “Searching versus Filtering” on page 55. The following sections describe the use of each method.

Search for Alerts with Advanced Search

If the SAS Social Network Analysis Server is configured with the advanced search feature, then a window that is similar to the following example might be displayed upon accessing the interface (if the administrator has enabled the initial search feature). This
window enables selection of search criteria so that only the alerts of interest are retrieved from the SAS Social Network Analysis Server.

**Display 3.2  Advanced Search Window**

If the advanced search feature is enabled, then the Advanced Search window can be opened any time the **Advanced Search** button ( alleen) is displayed by clicking the button on the toolbar.

The Advanced Search window is completely customizable and is unique for each deployment. It is common, however, for the Advanced Search window to display more than one tab. This enables users to select tabs and perform a search that is consistent with the current needs. Here are items to consider when using the advanced search.

- When multiple tabs are available, only the selections made on the tab in the forefront on submission are executed. This means that if you make changes on several tabs and then click the submit button, only the search criteria on the tab that was active when the submit button is clicked are submitted. All other criteria on the remaining tabs are ignored.
When multiple items are present and the total width of the items exceeds the horizontal space allocated for display, additional controls are presented to enable navigation between and selection of the items. Here is an example showing scroll controls (A and B) and a list control (C).

*Display 3.3  Example of Additional Controls in Tabbed Area*

- To scroll through the selection of tabs, click the scroll controls (A and B) and then select the tab name that you want.
- To jump directly to a tab, click the list control (C) to display a list of available tabs, and then select a tab name from the list.

The **Restore Defaults** option returns all tabs to their original state. The Advanced Search window remains open to allow additional changes to be made.

**Filter Alerts**

Whether the advanced search feature is enabled or not, after the alerts or entities are retrieved from the SAS Social Network Analysis Server and are displayed, additional features enable you to reduce the number of rows displayed to only the items of interest.

If your administrator has configured a **Filters** panel for the Alerts window, then the **Filters** panel appears to the left of the **Alerts** panel. The following example shows the
Alerts window with alerts filtered in the **Alerts** panel to show those that have an Alert Type of Service Provider.

**Display 3.4  Alerts Panel Filtered for Alert Type**

The **Filters** panel is expanded by clicking the **Expand Panel** button (✓) at the top of the panel and is collapsed by clicking the **Collapse Panel** button (✗) at the top of the panel.

Although each **Filters** panel (see “Filters Panel” on page 20) is customized for a specific deployment, the **Filters** panel buttons displayed at the top of the panel are standard. These buttons are used to perform a filtered search as well as to save filter preferences. See “Filter Preferences” on page 63.

**Text Search – Window Specific**

By default, a Search field is displayed within the main menu area of the interface. The Search area is always available, but its use produces different results depending upon the window that is active when the search is used.

You can filter alerts at the Alerts window by any text string or numeric value by entering it into the **Search** text box. As you type in the **Search** text box, row items not matching
the criteria are hidden from view. The following example shows the Alerts window filtered for the term “Service Provider.”

Display 3.5  Search Feature at the Alerts Window

Using the Search feature from the Details window of the SAS Social Network Analysis server results in tabular data being searched, where tabular data includes data in the **Entity Profile** panel as well as data in the **Related Information** panel. The items in the tabular data that match the search criteria are displayed, and all other tabular information is suppressed. The display of non-tabular information at the Details window is not affected by search.
Using the Search feature from the SAS Social Network Analysis tab of the Details window results in nodes with matching criteria being highlighted and tabular data in the Show Details panel (not displayed in the following image) being filtered to show only those rows of data that match the criteria.
To clear a search term (and restore the interface to the pre-search view), click \( \times \) to the right of the text in the **Search** text box.

### Investigate Alerts

### Review the Alert Details

By default, when you access an alert series within the SAS Social Network Analysis Server, the Alerts window is displayed. You can click a row item, generally an alert or an entity, in the **Alerts** panel to view the alert details. In the following display, Display 3.8 on page 71, an alert that warrants further investigation is selected at the **Alerts** panel.
Accessing the details related to an alert or entity displays customized information, depending on the setup and configuration provided by your administration team, specific to the alerted entity. For example, in the following display, the details related to Actionable Entity ID 0002 (selected in the previous display) are shown.
The information that is provided in the sample display is entirely configurable to meet the needs of the deployment.

**Review the Related Information**

The transactional data that is related to the alert and the alerted entity (a patient, a claim, an account, a physician, and so on) is typically shown in tables in the lower portion of the Details window. The number of tabs and the data that is shown depend on the deployment and the type of alerted entity.
If more than one tab is available, navigate the information by selecting tabs. You can select the vertical separator handle and drag it up or down to increase or reduce the size of the section that is used to display the transactional data.

**Display 3.10  Alert Transactions Display and Vertical Separator Handle**

![Alert Transactions Display](image)

**Review the Entity Profile Panel**

Depending on the analytics that are performed for identifying suspicious activity, charts and graphics might be displayed to provide more information about the alert and the alerted entity. Many tabs can be available in this panel, as shown in the following display. A control button (🗂️) at the top right section of the panel enables you to launch
the panel content in a floating window. The floating window contains **Previous** and **Next** buttons, as appropriate, to enable you to scroll between the tabbed content in this area.

**Display 3.11 Details Window with Entity Profile Information**

Review the Social Network Analysis Diagram

If the **SAS Social Network Analysis** tab has been configured for your deployment, click the **SAS Social Network Analysis** tab to view the entities and relationships that are associated with the alerted entity. In some instances, previously undetected relationships are noticed and the relationships increase the level of suspicion. The
following display shows a sample social network, with the **Cumulative** button selected to view the state of the network on May 11, 1998.

**Display 3.12 Social Network Analysis Diagram Example**

The icons and color that are used in a network diagram are configurable.

---

**Comment Alerts**

**Comments Feature Overview**

Depending on your configuration, you might have the Comment Manager enabled for your deployment. The comments feature provides a way for investigators to add comments and attachments to alerts and social network nodes. If this feature is enabled for your deployment, it is available from the **Related Information** panel of the Details
window as well as from the Show Details panel of the SAS Social Network Analysis tab.

**Adding a Comment to an Alert**

After selecting an alert to investigate, you can add a comment from the Details window. The comment is associated with the entity identifier and the entity type.

Comments are added under the name of a topic. After a topic is created, one or more comments can be added to the topic. Multiple topics can be added to an alert.

1. In the Details window, select the **Comment Manager** tab.

   **Display 3.13  Adding a Comment in the Details Window**

   ![Comment Manager](image)

2. If a new subject name is required for this comment, add the title in the **Subject** field, as shown by (A) in the following display.

   **Note:** If this comment is being added under an existing subject, then locate and expand the Subject in the list (as shown by (B) in the following display) to expose the remaining fields.
3 Enter a comment in the appropriate text field.

**Note:** The comment field supports a maximum of 255 characters, including space and punctuation.

4 If you want to add an attachment to the comment, click **Browse** to navigate to the item that you want to attach, and select the item to add it to the comment.

**Note:** You can add only one attachment to a comment.

5 To complete the process, click **Post**.

   A comment is now associated with the alert or entity.

You can add more than one comment to an alert or entity. All comments are listed separately and can be viewed individually.

### Adding a Comment to a Node

When the commenting feature is enabled, requesting the node details from the social network analysis diagram provides an opportunity to comment on the node.

1 Select a node from the social network analysis diagram and select **Show Details** from the **Properties** panel.
The **Show Details** panel is displayed beneath the SAS Social Network Analysis diagram.

**Display 3.14**  Adding a Comment on the SAS Social Network Analysis Tab

1. If a new subject name is required for this comment, add the title in the **Subject** field, as shown by (A) in the following display.

   **Note:** If this comment is being added under an existing subject, then locate and expand the Subject in the list (as shown by (B) in the following display) to expose the remaining fields.
3 Enter a comment in the appropriate text field.

4 If you want to add an attachment to the comment, click **Browse** to navigate to the item that you want to attach, and select the item to attach it to the comment.

   **Note:** You can add only one attachment to a comment.

5 To complete the process, click **Post**.

   A comment is now associated with the node.

You can add more than one comment to a node. All comments are listed separately and can be viewed individually.

---

**Determining the Disposition of Alerts**

After analyzing the available transactional data, charts, graphics, and social network diagrams, you must take some action on the alert. This action can be to indicate that no further investigation is required, or to assign a status that indicates progress toward taking action against the alerted entity (a person, patient, claim, and so on).
Depending on the configuration of your SAS Social Network Analysis Server and the permissions associated with your credentials, you might have access to Disposition menu items that launch a customized Alert Disposition window to enable you to process the alerts.

**Display 3.15  View of an Alert Disposition Window Launched from the Disposition Menu**

The availability of the Disposition menu items and the available states to use for determining the disposition of an alert are configurable.

To determine the disposition of an alert, from the Alerts window:

1. Enable the check box associated with one or more alerts to which a disposition method will be applied.

2. Select the appropriate disposition method from the drop-down list of choices.

**Note:** The options and the associated window are configurable and might not resemble the examples displayed in this guide. It is also possible that your administrator has configured your deployment to disallow disposition of items from the Alerts window. It is also possible that your instance is configured to disallow disposition of more than one item at a time.
3 Apply the appropriate disposition criteria and methods using the Alert Disposition window.

4 Click the submit button, which can have any name, to execute the disposition method specified by the selections in the Alert Disposition window.

If configured, a confirmation message is displayed in the Alerts window, and the Alert Disposition window closes.
Social Network Analysis

Examining and Manipulating the Social Network Analysis Diagram
- Accessing and Saving a Social Network Analysis Diagram
- Specifying the Social Network Analysis Diagram Layout
- Controlling a Map View
- Controlling the Location and Zoom of the Diagram or Nodes
- Rearranging the Diagram Nodes

Exploring and Managing Nodes
- Viewing Node Details
- Viewing Node and Link Properties
- Revealing and Collapsing Hidden Nodes
- Grouping Nodes
- Viewing Grouped Node Properties
- Expanding and Regrouping Grouped Nodes
- Editing Existing Nodes and Links
- Linking Existing Nodes
- Annotating or Viewing the Annotation of a Node
- Adding New Nodes and Links
- Adding Change Dates to Nodes
- Deleting Nodes and Links
Examining and Manipulating the Social Network Analysis Diagram

The social network analysis diagram is displayed based on a back-end algorithm. This means that the diagram item placement, layout, and so on, are drawn to the screen in a manner specified by a collection of analytical rules. The items (nodes) of the diagram layout and the zoom level can be controlled to allow the best view for analysis. When a diagram has been changed, depending on your system configuration and the permissions associated with your user credentials, you might be able to save the diagram.

Accessing and Saving a Social Network Analysis Diagram

When your instance of the SAS Social Network Analysis Server is deployed, the administrators configure the solution for the business needs of the installation. This includes, but is not limited to, surfacing a social network analysis diagram to enable visualization of the entity interactions. The initial diagram is created based on stored processes and is available by default when the network is accessed initially. Saved diagrams are stored in the database, leaving the original diagram generated by the stored process unchanged. By default, each subsequent time that the diagram is accessed, the diagram from the database is retrieved.

To access the default social network analysis diagram, if it is configured for your deployment:

1. From the Alerts window, click a row item.
   
   Clicking a row item (generally an alert or an entity), displays the Details window.
   
   **Note:** The tab displayed, either Details or SAS Social Network Analysis, is configurable. The default operation is that the Details tab is displayed when a row item is selected from the Alerts window.

2. At the Details window, select the SAS Social Network Analysis tab.
If it is configured, the social network analysis diagram is displayed.

This diagram is retrieved from the directives of the stored process if it has never been saved, or it is retrieved from the solution database if it has been previously saved.

To access a specific social network analysis diagram:

1. Follow the previous procedure for accessing the default social network analysis diagram.

2. At the **SAS Social Network Analysis** tab, select the down arrow (▼) next to the **Open** () icon and do one of the following:

   - To retrieve the initial diagram as configured by the administrator, select **From Stored Process** from the menu.
   - To retrieve the latest diagram saved by a user, select **Last Saved to Database** from the menu.

   The specified diagram is displayed.

The social network analysis diagram can be manipulated and managed to enable visualization of the important relationships and to add or delete nodes and links as needed. To preserve your changes, you must save the diagram. When you save the diagram, it is saved to the solution database. The original diagram, generated by the stored process, is unchanged and can be retrieved as needed.

To save a social network analysis diagram:

1. Access the **SAS Social Network Analysis** tab at the Details window and perform network management tasks as needed.

2. From the main menu, select **Save** () to save the diagram to the solution database.

   A confirmation message is displayed at the top of the window.
Specifying the Social Network Analysis Diagram Layout

In the base installation, the social network analysis diagram layout has two possible modes, Tree and Springy. The Springy layout is a force-directed layout presented with an option of three levels of incremental optimization (400, 4,000, and 40,000) of the network. Depending on the size of your social network analysis diagram, the purpose for the current review, and the length of time the diagram takes to load, you might want to change the layout for your current session. Here are the layouts available.

<table>
<thead>
<tr>
<th>Layout</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree Layout</td>
<td>Displays the hierarchical relationship of the nodes against the time line of activity.</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> If your data cannot be organized into a hierarchy, then a message to that effect is presented, and the diagram is not updated.</td>
</tr>
<tr>
<td>Springy (400)</td>
<td>This is the default layout option for the social network analysis diagram. It executes 400 iterations to produce the diagram.</td>
</tr>
<tr>
<td>Springy (4000)</td>
<td>This layout option executes 4,000 iterations to produce the diagram.</td>
</tr>
<tr>
<td>Springy (40000)</td>
<td>This layout option executes 40,000 iterations to produce the diagram.</td>
</tr>
</tbody>
</table>

Here are examples of the same data displayed using each of the layout options. As the examples illustrate, the increased iterations of the Springy layout force the diagram nodes to spread out more. In this context, iteration is defined as an incremental optimization of the graph layout such that link overlaps are minimized. Viewing the same data with different layouts might cause some relationships to become more or less obvious, depending on the layout selection. Again, this is because the goal of additional iterations (400, 4,000, 40,000) is to optimize the layout through node placement so as to minimize link overlapping.

**Note:** If your diagram does not have a significant number of nodes, the difference between the Springy layout modes might be imperceptible.
Display 4.1  Example of Tree Layout
Display 4.2 Example of Springy (400) Layout
Display 4.3  Example of Springy (4000) Layout
If you change a layout, the change applies to the current session, and the diagram will return to the default layout when you exit from the session.

To change the layout of the current social network analysis diagram, select the down arrow (▼) near the Run Layout (▶) button on the toolbar, and select the option from the drop-down menu.
If the layout that you select is supported by the data, then the social network analysis diagram updates to display the new layout.

**Controlling a Map View**

Depending on how your deployment is configured, you might be able to superimpose the social network analysis diagram onto a preconfigured map view to enable geographic reference while reviewing and managing the interactions.

The following rules apply to the map view:

- Nodes must have a longitude and a latitude value in order to be displayed in the map view.
  
  In the map view, because nodes are pinned to their longitudinal and latitudinal positions, they cannot be moved.

- You can view a list of nodes without a longitude and a latitude value by selecting the **See Nodes** link at the base of the map view.

- In the map view, groups are not displayed. Instead, the individual nodes, if they have longitude and latitude values, are shown. Within groups, you can view nodes that do not have longitude and latitude values by selecting the **See Nodes** link at the base of the map view.

- In the map view, entity properties (see “Viewing Node and Link Properties” on page 97), node details (see “Viewing Node Details” on page 95), the search feature for visible nodes, and time line functionality are all valid functions.
The following display shows an example map view along with the See Nodes window listing the nodes not displayed in the view.

Display 4.5 Map View Showing See Nodes Window

To view the social network analysis diagram with a map in the background:

1. From the Alerts window, click a row item.
   
   Clicking a row item (generally an alert or an entity), displays the Details window.
   
   Note: The tab displayed, either Details or SAS Social Network Analysis, is configurable. The default operation is that the Details tab is displayed when a row item is selected from the Alerts window.

2. At the Details window, select the SAS Social Network Analysis tab.
   
   If it is configured, the social network analysis diagram is displayed.
Select the **Show Map** (지도) icon from the toolbar.

**Note:** This icon is enabled only if the Map feature can be invoked.

The diagram is superimposed on a map. The toolbar buttons, with the exception of the **Hide Map** (를 숨기기) button, are dimmed and inaccessible.

**TIP** Use the mouse wheel and keyboard arrow keys to zoom in and out and to move the map view. Here are the available controls:

- To zoom in, rotate the mouse wheel away from you.
- To zoom out, rotate the mouse wheel toward you.
- To move the map to the left, use the right arrow keyboard key.
- To move the map to the right, use the left arrow keyboard key.
- To move the map down, use the up arrow keyboard key.
- To move the map up, use the down arrow keyboard key.

**Note:** If entities were highlighted in the non-map view and are not displayed as highlighted when the map view is invoked, then click anywhere on the map to cause the appropriate entities to be displayed as highlighted in the map view.

To restore the diagram to the default, non-map, display:

- Select the **Hide Map** (를 숨기기) button from the toolbar.

  The diagram is redrawn without the map displayed in the background.

### Controlling the Location and Zoom of the Diagram or Nodes

Although the nodes of a social network analysis diagram can be managed individually, several features allow the entire diagram to be moved. During the course of working with the diagram, the diagram might become off-center or might not be displayed in a way that shows the important features in a focal-point area. Several buttons, if
configured, enable you to have the diagram redrawn to reposition the items. Available features enable you to perform the following tasks:

- center the diagram
- move the diagram left, right, up, or down
- zoom in or out to view a specific node or diagram area

The toolbar buttons for controlling the location and zoom feature of the social network analysis diagram are listed in the following table.

<table>
<thead>
<tr>
<th>Task</th>
<th>Toolbar Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center the diagram</td>
<td></td>
<td>Use this control to center the network diagram in the display. Click the down arrow (omore) next to the Home button to reveal the buttons for moving the diagram.</td>
</tr>
<tr>
<td>Move the diagram</td>
<td>← → ↑ ↓</td>
<td>Revealed by clicking the down arrow (omore) next to the Home button, these arrows move the diagram in the indicated directions.</td>
</tr>
<tr>
<td>Zoom in on the diagram</td>
<td>+</td>
<td>Zoom in on the diagram. The zoom is executed for each press of the button until maximum size is reached.</td>
</tr>
<tr>
<td>Note: You can also place your mouse pointer over an entity or area and roll the mouse wheel away from you to zoom in on the entity or area.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoom out on the diagram</td>
<td>−</td>
<td>Zoom out on the diagram. The zoom is executed for each press of the button until minimum size is reached.</td>
</tr>
<tr>
<td>Note: You can also place your mouse pointer over an entity or area and roll the mouse wheel toward you to zoom out on the entity or area.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Rearranging the Diagram Nodes

Diagram nodes can be moved to allow the best possible experience for viewing and analyzing the displayed information.

To move a node, drag the node to the new location.

**Note:** The node that is being dragged will rest on top of any nodes that it is dropped onto. So dragging node A to node B, for example, will place node A on top of node B. Dragging node B to node A will place node B on top of node A. The layered placement of nodes when dragging and dropping is not time dependent. This means that regardless of the order of the appearance of the node on the time line, the order of the layers is based on where they are dragged, and not on which node appeared before the other.

To move more than one node at a time, either use the mouse to lasso the nodes, or select multiple nodes by using holding down the Ctrl key and clicking to select the nodes. Then drag the collection of nodes to the new location.

Exploring and Managing Nodes

Viewing Node Details

Depending on how your administrative team has configured your deployment, you might have details associated with specific nodes in your network view. A table of node details might appear on a tab beneath the time slider control.

To view the **Show Details** panel with details related to an indicated node:

- Double-click a node. The **Properties** panel is expanded. Click the **Show Details** button in the **Properties** panel. The **Show Details** panel is expanded at the bottom of the window, as configured by your administrator.

After the **Show Details** panel is expanded, clicking a new node repopulates the panel with information pertaining to the newly selected node. Group details are not available, and clicking a group or selecting more than one node hides the **Show Details** panel.
Here is a sample window showing an expanded **Show Details** panel with details related to the selected Node A.

**Display 4.6  Example Window Showing Expanded Show Details Panel**

The **Show Details** panel is fully customizable.

If there is tabular data displayed in the **Show Details** panel, the tabular data is searchable. As shown in **Display 4.7**, when you search for the letter A at the SAS
**Social Network Analysis** tab, nodes meeting the criteria are highlighted, and row data in the table is excluded from the list if the row does not contain the search term.

**Display 4.7**  *Example Window Showing Search Criteria Highlighting and Exclusion*

**Viewing Node and Link Properties**

All nodes and links of a network diagram include properties to identify or specify the physical parameters of the nodes and links.

To view the properties associated with a node or a link:

1. Select a node or a link from the social network analysis diagram.

   **TIP** Because the narrow width of links in most non-zoomed views makes them difficult to select, you might have to zoom in on the link to select it.
Note: In order for node or link properties to be displayed in the Properties panel, the node or link must be selected by clicking it. The Properties panel does not display the properties of a node that has been selected by lassoing with the mouse.

2 Expand the Properties panel to view the associated properties.

**TIP** If you double-click a node or a link, the Properties panel expands automatically.

---

Display 4.8  Example of Node Properties Displayed

---

**Revealing and Collapsing Hidden Nodes**

When a node is hidden, the attached node displays a plus sign (++) at the bottom of the node to indicate that there is information that is not displayed. Clicking the plus sign reveals nodes to show their place in the social network analysis diagram.
To reveal hidden nodes:

1. Locate a non-group node displaying a plus sign at the bottom.

2. Click the plus sign at the bottom of the node.
   
   Hidden nodes and associated links appear in the social network analysis diagram.
   
   **Note:** You must save the diagram to save the changes that you made to the node or link.

3. To save your updates, click **Save**.
   
   A confirmation message is displayed at the top of the window.

To collapse (or re-hide) the revealed nodes:

- Select the **Collapse Expanded Nodes** button from the social network analysis diagram toolbar.
   
   The nodes that were expanded last are collapsed to conceal the originally hidden nodes.

### Grouping Nodes

To group nodes, perform the following steps:

1. Click a node that will be included in the group.
   
   A border is displayed around the item to indicate that it is successfully selected.

2. Hold down the CTRL key and click each of the remaining nodes that will be included in the group.
   
   Each selected node is displayed with a border surrounding it to indicate that it is selected.
**TIP** To select nodes, you can also use the mouse to lasso the nodes. When you release the mouse button, those nodes encircled will have a black border to indicate that they are selected. You can use this method in conjunction with holding down the Ctrl key and clicking to add more nodes to the selection.

**Note:** Groups cannot be nested. Therefore, only nodes can be added to a group. Selecting a group and attempting to include it in another group results in a warning message being displayed.

3. Select the **Group Nodes** button to group the nodes into a single icon.

**Display 4.9**  *Example Showing a Black Border on Selected Nodes*

**Viewing Grouped Node Properties**

Here is an example of a node that represents a group. There is no limit to the number of groups that might be displayed in the social network analysis diagram.
A grouped node can contain two or more nodes. By reviewing the properties of a group, you can see a list of all nodes in the group, and you can view and modify annotations associated with a node without expanding the group. Nodes that were added to the network as part of the network generation process (as opposed to manual addition) also show name-value pair information, as appropriate.

To view grouped node properties, at the **SAS Social Network Analysis** tab:

1. Expand the **Properties** panel.

2. Click a group.
   
   The **Properties** panel displays a list of nodes included in the selected group.

3. Select a node to view its properties.

**TIP** Annotations related to the selected node can be added or modified through the **Annotation** text box. Clicking **Apply** saves the annotation with the node.
Expanding and Regrouping Grouped Nodes

Nodes representing groups are displayed as shown in Display 4.10 on page 101, including the plus sign (+) at the bottom of the icon to indicate that there is information that is not displayed. Clicking the plus sign expands the group to show the contained nodes.

To expand the group:

- Click the plus sign at the base of a Group icon.

  The nodes in the group are displayed, and the graph might be redrawn to better display the diagram.

To regroup nodes easily:

- Select the Regroup Nodes button ( ) from the social network analysis diagram toolbar.

  The nodes that were ungrouped last are regrouped.

The following rules apply to regrouping nodes:

- When multiple groups have been expanded, selecting the Regroup Nodes button collapses the groups in the reverse order of the original expansion process. So, for example, if groups one, two, and three are expanded (in that order), then the regrouping occurs in the order of group three, group two, and then group one.

- If a node in the group is included in a new group before you attempt to regroup the original group, then the Regroup Nodes button is inaccessible and this procedure cannot be completed.

- If a node in an expanded group is deleted before you attempt to regroup, then the Regroup Nodes button is inaccessible and this procedure cannot be completed.
Editing Existing Nodes and Links

Most of the parameters associated with nodes and links can be updated. The edited information replaces the previous information.

To edit a node or a link:

1. Select the node or the link from the social network analysis diagram.
   
   **TIP** Because the narrow width of links in most non-zoomed views makes them difficult to select, you might have to zoom in on the link to select it.

   **Note:** In order for node or link properties to be displayed in the Properties panel, the node or link must be selected by clicking it. The Properties panel does not display the properties of a node that has been selected by lassoing with the mouse.

2. Choose Edit Entity from the toolbar.
   
   The node- or link-specific Graph Entities Wizard is displayed.

3. Make the required updates and click OK to return to the diagram.
   
   **Note:** You must save the diagram to save the changes that you made to the node or link.

4. To save your updates, click Save.
   
   A confirmation message is displayed at the top of the window.

Linking Existing Nodes

When reviewing a social network analysis diagram, you might notice a potential connection that is not automatically linked by the solution. You can add links manually to draw a connection between nodes.

To add a link between existing nodes:
1 Select the nodes to which a link will be added and click the Add Link button (>Add Link) from the social network analysis diagram toolbar.

The Graph Entities Wizard appears.

For additional information about the link properties in the Graph Entities Wizard, see Table 2.7 on page 45.

2 Specify the parameters for the link that joins the nodes.

3 After all the parameters have been specified, click OK to continue.

The new link appears in the diagram connecting the indicated nodes.

Note: You must save the diagram to save the changes that you made to the node or link.

4 To save your updates, click Save (Save).

A confirmation message is displayed at the top of the window.

Annotating or Viewing the Annotation of a Node

For nodes that are drawn by the system as well as for nodes that you add to the diagram, annotations can be added to provide additional information about a node. The node annotations are displayed in the Properties panel when the node is selected.

To annotate an existing node or to view its annotation:

1 Identify the node that you want to annotate or whose annotation you want to view.

2 Do one of the following:
   - Double-click the node to reveal the Properties panel.
     The Properties panel contains an unlabeled Annotation text box.
   - Click the node and then click Edit Entity (Edit Entity) from the toolbar.
     The Graph Entities Wizard is displayed, showing the Annotation text box.
The **Annotation** text box enables you to add an annotation or to view or edit an existing annotation.

**Note:** The **Annotation** box accepts text-only entries. For example, you cannot include HTML markup with the annotation.

**Note:** For node or link properties to be displayed in the **Properties** panel, the node or link must be selected by clicking it. The **Properties** panel does not display the properties of a selected node that has been selected by lassoing with the mouse.

3. Enter text for the annotation or modify existing annotation text.

4. Do one of the following:
   - If you added or edited the annotation at the **Properties** panel, click **Apply** to save your changes.
   - If you added or edited the annotation at the Graph Entities Wizard, click **OK** to save your changes.

**Note:** You must save the social network analysis diagram to save the changes that you made to the node or link.

5. To save your updates, click **Save (保存)**.

A confirmation message is displayed at the top of the window.

### Adding New Nodes and Links

You can add nodes to the social network analysis diagram by invoking the Graph Entities Wizard from the toolbar **Add Node** button. When adding a node to a social network analysis diagram, you specify the features of the node as well as the features of the link connecting the node to the diagram. This feature also enables you to add an annotation during new node creation or after the node is added to the diagram.

To add new nodes and links to a diagram:

1. Select a node to which you want to link the new node.

2. From the main menu, select **Add Node (添加)**.
The Graph Entities Wizard is displayed, enabling you to specify the node properties as well as the link properties. From the Add Node tab of the Graph Entities Wizard, you can also indicate that a specific node is to change one or more properties on a specific date within the link period. (See “Adding Change Dates to Nodes” on page 106 for additional information.)

3 Specify the parameters for the node and for the link that joins the nodes.

4 After all the parameters have been specified, click OK to continue.

   The new node and associated link are dropped onto the diagram and are linked to the originally selected node.

5 At the diagram, drag the new node to your location of choice.

   **TIP** If additional links are needed between the new node and existing nodes, use the Add Link (.addButton) button to add additional links to other nodes. See “Linking Existing Nodes” on page 103.

   **Note:** You must save the diagram to save the changes that you made to the node or link.

6 To save your updates, click Save (.)

   A confirmation message is displayed at the top of the window.

The types of nodes and specifications for the links are configurable. Therefore, the options available to you for a specific analytic domain might not be the same options available to you if you have access to a different analytic domain.

**Adding Change Dates to Nodes**

During node creation (see “Adding New Nodes and Links” on page 105), or when you edit an existing node afterward (see “Editing Existing Nodes and Links” on page 103), you can indicate specific dates at which a change occurred. Change dates can also be accompanied by the inclusion of an icon symbol and node attributes that differ from the original.
To indicate a change date for a node:

1. At the Graph Entities Wizard, locate the **Change Dates** area.

   **Display 4.12  Graph Entities Wizard Showing the Change Dates Area**

2. Ensure that the initial state of the node (color, border color, and icon) is correct.

3. At the **Change Dates** area, click **Add Row** to insert a new row beneath the default row.

4. At the new row, indicate the change date as well as the symbol background color (**Color**), border color, and icon of the node for the specific date.

   **Display 4.13  Example of Change Dates Row Added**
5 If additional change dates are required, repeat the preceding two steps to add and customize the nodes for a specific date.

6 Click OK to save your changes and return to the network diagram.

In the network diagram, as the time slider reaches the specified change dates, the node changes to represent the attributes indicated on those change dates. This is true in the standard network view as well as in the map view (if it is enabled for your deployment).

**Deleting Nodes and Links**

Occasionally you might want to remove a node from view or a link from specific nodes. Depending on your rights and the solution configuration, you might be able to remove a node or a link (delete it from the diagram). If you delete a node or a link, it cannot be recovered.

**Note:** A node or a link cannot be deleted if that action would leave a node unlinked from other nodes in the network. In these instances, the Delete option is disallowed.

To delete a node or a link:

1 Locate the node or link that you want to delete and select it on the social network analysis diagram.

2 With the node or link selected, choose Delete Entity (Delete Entity) from the toolbar.

   The node or link is removed from the diagram.

   **Note:** You must save the diagram to save the changes that you made to the node or link.

3 To save your updates, click Save (Save).

   A confirmation message is displayed at the top of the window.
## Index

### A
- accessing the investigator interface 9
- adding nodes 41, 105
- administration 6
- Advanced Search panel 55, 64
- Alert Disposition panel 16, 80
- alerts
  - adding comments 76
  - creation 4
  - investigating 7, 70
  - investigation process 60
  - managing and disposing of related 79
  - searching and filtering 64
  - trigger conditions 4
- Alerts panel 17
- Alerts report 70
- Alerts workspace 17
- analysis
  - top-down versus bottom-up 5
- annotating nodes 39, 104

### B
- bottom-up analysis 5

### C
- comments
  - adding to alerts 76
  - adding to nodes 77
  - configuration 6

### D
- deleting nodes 108
- Details tab 24
- Details workspace 22
- disposing of alerts 79
- documentation 6
- drawing node links 106

### E
- entities 4
- Entity Profile panel 25, 73

### F
- Filter Panel 20, 57, 66
- filtering
  - alerts 66
  - page contents 70
versus filtering 55
social network analysis diagram 28, 74, 84
See also nodes (social network analysis diagram)
moving, rotating, and zooming 93
specifying layout 86
time slider 48
toolbar 36
Social Network Analysis tab 24, 74

T
time slider 48
toolbars
  main 13
  social network analysis diagram 36
top-down analysis 5
trigger conditions for alerts 4

U
user interface