

Workflows

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Workflows

A workflow is a tailored series of data pages on the Firewall Management Center web interface that analysts can use to evaluate events generated by the system.

Workflow types

These types of workflows are available in Firewall Management Center:

- Predefined workflows: Preset workflows delivered with the system. You cannot edit or delete a predefined workflow. You can, however, copy a predefined workflow and use it as the basis for a custom workflow.
- Saved custom workflows: Custom workflows based on saved custom tables delivered with the Firewall Management Center. You can edit, delete, and copy these workflows.
- Custom workflows: Workflows that you create and customize for your specific needs, or that the system generates automatically when you create custom tables. You can edit, delete, and copy these workflows.

The data displayed in a workflow often depends on such factors as how you license and deploy your managed devices, and whether you configure features that provide the data.

Predefined workflows

Predefined workflows are workflow templates that

- are delivered with the system and cannot be edited or deleted

- can be copied to serve as the basis for custom workflows, and
- provide standardized workflow structures for common use cases.

Predefined intrusion event workflows

This table describes the predefined intrusion event workflows included with the system.

Table 1: Predefined intrusion event workflows

Workflow name	Description
Destination Port	Because destination ports are usually tied to an application, this workflow can help you detect applications that are experiencing an uncommonly high volume of alerts. The Destination Port column can also help you identify applications that should not be present on your network.
Event-Specific	This workflow provides two useful features. Events that occur frequently may indicate: • false positives • a worm • a badly misconfigured network Events that occur infrequently are most likely evidence of a targeted attack and warrant special attention.
Events by Priority and Classification	This workflow lists events and their type in order of event priority, along with a count showing how many times each event has occurred.
Events to Destinations	This workflow provides a high-level view of which host IP addresses are being attacked and the nature of the attack; where available, you can also see information about the countries involved in attacks.
IP-Specific	This workflow shows which host IP addresses are generating the most alerts. Hosts with the greatest number of events are either public-facing and receiving worm-type traffic (indicating a good place to look for tuning) or require further investigation to determine the cause of the alerts. Hosts with the lowest counts also warrant investigation as they could be the subject of a targeted attack. Low counts may also indicate that a host may not belong on the network.
Impact and Priority	This workflow lets you find high-impact recurring events quickly. The reported impact level is shown with the number of times the event has occurred. Using this information, you can identify the high-impact events that recur most often, which might be an indicator of a widespread attack on your network.
Impact and Source	This workflow can help you identify the source of an attack in progress. The reported impact level is shown with the associated source IP address for the event. If, for example, events with a level 1 impact are coming from the same source IP address repeatedly, they may indicate an attacker who has identified vulnerable systems and is targeting them.
Impact to Destination	You can use this workflow to identify events repeatedly occurring on vulnerable computers, so you can address the vulnerabilities on those systems and stop any attacks in progress.
Source Port	This workflow indicates which servers are generating the most alerts. You can use this information to identify areas that require tuning, and to decide which servers require attention.

Workflow name	Description
Source and Destination	This workflow identifies host IP addresses sharing high levels of alerts. Pairs at the top of the list could be false positives, and may identify areas that require tuning. You can check pairs at the bottom of the list for targeted attacks, for users accessing resources they should not be accessing, or for hosts that do not belong on the network.

Predefined malware workflows

This table describes the predefined malware workflows included on the Firewall Management Center. All predefined malware workflows use the table view of malware events.

Table 2: Predefined malware workflows

Workflow name	Description
Malware Summary	This workflow provides a list of the malware detected in network traffic or by Secure Endpoint Connectors, grouped by individual threat.
Malware Event Summary	This workflow provides a quick breakdown of the different malware event types and subtypes.
Hosts Receiving Malware	This workflow provides a list of host IP addresses that have received malware, grouped by the malware files' associated dispositions.
Hosts Sending Malware	This workflow provides a list of host IP addresses that have sent malware, grouped by the malware files' associated dispositions.
Applications Introducing Malware	This workflow provides a list of host IP addresses that have received files, grouped by the associated malware dispositions for those files.

Predefined file workflows

This table describes the predefined file event workflows included in Firewall Management Center. All predefined file event workflows use the table view of file events.

Table 3: Predefined file workflows

Workflow name	Description
File Summary	This workflow provides a quick breakdown of the different file event categories and types, along with any associated malware dispositions.
Hosts Receiving Files	This workflow provides a list of host IP addresses that have received files, grouped by the associated malware dispositions for those files.
Hosts Sending Files	This workflow provides a list of host IP addresses that have sent files, grouped by the associated malware dispositions for those files.

Predefined captured file workflows

The predefined captured file workflows included on the Firewall Management Center use the table view of captured files.

Table 4: Predefined captured file workflows

Workflow name	Description
Captured File Summary	This workflow provides a breakdown of captured files based on type, category, and threat score.
Dynamic Analysis Status	This workflow provides a count of captured files based on whether they have been submitted for dynamic analysis.

Predefined connection data workflows

All predefined connection data workflows use the table view of connection data to provide various analytical perspectives of network activity and traffic patterns.

Table 5: Predefined connection data workflows

Workflow name	Description
Connection Events	This workflow provides a summary view of basic connection and detected application information, which you can then use to drill down to the table view of events.
Connections by Application	This workflow contains a graph of the 10 most active applications on the monitored network segment, based on the number of detected connections.
Connections by Initiator	This workflow contains a graph of the 10 most active host IP addresses on the monitored network segment, based on the number of connections where the host initiated the connection transaction.
Connections by Port	This workflow contains a graph of the 10 most active ports on the monitored network segment, based on the number of detected connections.
Connections by Responder	This workflow contains a graph of the 10 most active host IP addresses on the monitored network segment, based on the number of connections where the host IP was the responder in the connection transaction.
Connections over Time	This workflow contains a graph of the total number of connections on the monitored network segment over time.

Workflow name	Description
Traffic by Application	This workflow contains a graph of the 10 most active applications on the monitored network segment, based on the number of kilobytes transmitted. Application counts reflect each detector that matched against an application connection. The same application session may be represented more than once in the list depending on whether an application protocol, web application, client detector, or internal detector matched the traffic, as well as whether the traffic originated from a mobile device or was part of an encrypted session. If the application was seen in a client flow and no specific client detector exists, a generic client may be reported. For example, you may see the same session of YouTube traffic reported as **YouTube** (because it matched a YouTube web application detector) and as **YouTube client** (because an internal YouTube detector matched against characteristics typically seen in a client session). Use the information in the connection events and network map for your network to determine more context for specific application connections.
Traffic by Initiator	This workflow contains a graph of the 10 most active host IP addresses on the monitored network segment, based on the total number of kilobytes transmitted from each address.
Traffic by Port	This workflow contains a graph of the 10 most active ports on the monitored network segment, based on the number of kilobytes transmitted.
Traffic by Responder	This workflow contains a graph of the 10 most active host IP addresses on the monitored network segment, based on the total number of kilobytes received by each address.
Traffic over Time	This workflow contains a graph of the total kilobytes transmitted on the monitored network segment over time.
Unique Initiators by Responder	This workflow contains a graph of the 10 most active responding host IP addresses on the monitored network segment, based on the number of unique initiators that contacted each address.
Unique Responders by Initiator	This workflow contains a graph of the 10 most active initiating host IP addresses on the monitored network segment, based on the number of unique responders that the addresses contacted.

Predefined security intelligence workflows

This table describes the predefined Security Intelligence workflows included on the Firewall Management Center. All the predefined security-related connection workflows use the table view of security-related connection events.

Table 6: Predefined security intelligence workflows

Workflow name	Description
security-related connection events	This workflow provides a summary view of basic security-related connection and detected application information, which you can then use to drill down to the table view of events.
security-related connection summary	This workflow is identical to the security-related connection events workflow, but begins with the Security-related Connection Summary page, which lists security intelligence events by category and count only.

Workflow name	Description
security-related connection with DNS details	This workflow is identical to the security-related connection events workflow, but begins with the security-related connection with DNS Details page, which lists security-related connection events by category and DNS-related characteristics.

Predefined host workflows

This table describes the predefined workflows that you can use with host data.

Table 7: Predefined host workflows

Workflow name	Description
Hosts	This workflow contains a table view of hosts followed by the host view. Workflow views based on the Hosts table allow you to easily view data on all IP addresses associated with a host.
Operating System Summary	You can use this workflow to analyze the operating systems in use on your network.

Predefined indications of compromise workflows

This table describes the predefined workflows that you can use with indications of compromise (IOC) data.

Table 8: Predefined indications of compromise workflows

Workflow name	Description
Host Indications of Compromise	This workflow begins with a summary view of IOC data grouped by count and category, and provides a detail view that further subdivides the summary data by event type. Access this workflow via the **Analysis** > **Hosts heading** > **Hosts** menu.
Indications of Compromise by Host	You can use this workflow to gauge which hosts on your network are most likely to be compromised (based on IOC data). Access this workflow via the **Analysis** > **Hosts heading** > **Hosts** menu.
User Indications of Compromise	This workflow begins with a summary view of IOC data grouped by count and category, and provides a detail view that further subdivides the summary data by event type. Access this workflow via the **Analysis** > **Users heading** > **Users** menu.
Indications of Compromise by User	Use this workflow to gauge which users on your network are most likely to be involved in potential compromises (based on IOC data.) Access this workflow via the **Analysis** > **Users heading** > **Users** menu.

Predefined applications workflows

This table describes the predefined workflows that you can use with application data.

Table 9: Predefined applications workflows

Workflow name	Description
Application Business Relevance	You can use this workflow to analyze running applications of each estimated business relevance level on your network, so you can monitor appropriate use of your network resources.
Application Category	You can use this workflow to analyze running applications of each category (such as email, search engine, or social networking) on your network, so you can monitor appropriate use of your network resources.
Application Risk	You can use this workflow to analyze running applications of each estimated security risk level on your network, so you can estimate the potential risk of users' activity and take appropriate action.
Application Summary	You can use this workflow to obtain detailed information about the applications and associated hosts on your network, so you can closely examine host application activity.
Applications	You can use this workflow to analyze running applications on your network, so you can gain an overview of how the network is being used.

Predefined application details workflows

This table describes the predefined workflows that you can use with application detail and client data.

Table 10: Predefined application details workflows

Workflow Name	Description
Application Details	You can use this workflow to analyze the client applications on your network in more detail. The workflow then provides a table view of client applications, followed by the host view.
Clients	This workflow contains a table view of client applications, followed by the host view.

Predefined servers workflows

This table describes the predefined workflows that you can use with server data.

Table 11: Predefined servers workflows

Workflow name	Description
Network Applications by Count	You can use this workflow to analyze the most frequently used applications on your network.
Network Applications by Hit	You can use this workflow to analyze the most active applications on your network.
Server Details	You can use this workflow to analyze the vendors and versions of detected server application protocols in detail.
Servers	This workflow contains a table view of applications followed by the host view.

Predefined host attributes workflows

This table describes the predefined workflow that you can use with host attribute data.

Table 12: Predefined host attributes workflows

Workflow name	Description
Attributes	You can use this workflow to monitor IP addresses and status of the hosts on your network.

The predefined discovery events workflow

This table describes the predefined workflow that you can use to view discovery and identity data.

Table 13: Predefined discovery event workflows

Workflow name	Description
Discovery Events	This workflow provides a detailed list, in table view form, of discovery events, followed by the host view.

Predefined user workflows

This table describes the predefined workflow that you can use to view user discovery and user identity data.

Table 14: Predefined user workflows

Workflow name	Description
Active Sessions	This workflow provides a list of active sessions collected by user identity sources.
Users	This workflow provides a list of user information collected by user identity sources.

Predefined vulnerabilities workflows

This table describes the predefined vulnerabilities workflow included in Firewall Management Center.

Table 15: Predefined vulnerabilities workflows

Workflow name	Description
Vulnerabilities	You can use this workflow to review vulnerabilities in the database, including a table view of only those active vulnerabilities that apply to the detected hosts on your network. The workflow provides a vulnerability detail view, which contains a detailed description for every vulnerability that meets your constraints.

Predefined third-party vulnerabilities workflows

This table describes the predefined third-party vulnerabilities workflows included on the Firewall Management Center.

Table 16: Predefined Third-Party vulnerabilities workflows

Workflow name	Description
Vulnerabilities by IP Address	You can use this workflow to quickly see how many third-party vulnerabilities you have detected per host IP address on your monitored network.
Vulnerabilities by Source	You can use this workflow to quickly see how many third-party vulnerabilities you have detected per third-party vulnerability source, such as the QualysGuard Scanner.

Predefined correlation and Allow list workflows

There is a predefined workflow for each type of correlation data, allow list events, allow list violations, and remediation status events.

Table 17: Predefined correlation workflows

Workflow name	Description
Correlation Events	This workflow contains a table view of correlation events.
Allow List Events	This workflow contains a table view of allow list events.
Host Violation Count	This workflow provides a series of pages that list all the host IP addresses that violate at least one allow list.
Allow List Violations	This workflow includes a table view of allow list violations that lists all violations with the most recently detected violation at the top of the list. Each row in the table contains a single detected violation.
Status	This workflow contains a table view of remediation status, which includes the name of the policy that was violated and the name and status of the remediation that was applied.

Predefined system workflows

The system is delivered with some additional workflows, including system events such as audit events and health events, as well as workflows that list results from rule update imports and active scans.

Table 18: Additional predefined workflows

Workflow name	Description
Audit Log	This workflow contains a table view of the audit log that lists audit events.
Health Events	This workflow displays events triggered by the health monitoring policy.

Workflow name	Description
Rule Update Import Log	This workflow contains a table view listing information about both successful and failed rule update imports.
Scan Results	This workflow contains a table view listing each completed scan.

Custom table workflows

Custom table workflows are workflows that are automatically created when you create custom tables using data from two or more event types. These workflows allow you to view and analyze events associated with the custom table.

Custom table workflow usage

You can use the custom tables feature to create tables that combine data from multiple event types. For example, you can create tables and workflows that correlate intrusion event data with discovery data for simplified searching of critical system events.

When you create a custom table, the Firewall Management Center automatically creates a workflow that you can use to view the events associated with the table. The features in the workflow differ depending on which type of table you use. The specific features of the workflow depend on the type of table you use. For example, custom table workflows based on the intrusion event table always end with the packet view, while those based on discovery events end with the host view.

Unlike workflows based on the predefined event tables, workflows based on custom tables do not have links to other types of workflows.

Use workflows

Workflows provide structured navigation through event data using table views and drill-down pages. You can modify displays, constrain data views, and access additional information through various interactive elements.

Procedure

Step 1 Access the workflow page that you want to use. For instructions, refer to Workflow selection, on page 12.

Step 2 To navigate within the current workflow, use these options:

- To view all of the columns available in your chosen event data type, use table view pages. For more information, refer to Use table view pages, on page 18.
- To view a subset of the columns available in your chosen event data type, use drill-down pages. For more information, refer to Use drill-down pages, on page 18.
- To display the corresponding row in the next page of the workflow, click **Down-Arrow** (▼).

- To move among the pages of a multipage workflow, use the tools at the bottom of each page. For more information, refer to Workflow page traversal tools, on page 16.
- To view the same constraints applied within a workflow for a different type of event, click **Jump to** and choose the event view from the drop-down list.

Step 3 To modify the display of the current workflow, perform these steps:

- Check the check boxes by one or more rows on a page to indicate which row(s) you want to affect, then click one of the buttons at the bottom of the page (for example, **View**) to perform that action for all selected rows.
- Check the check box at the top of the row to select all the rows on the page, then click one of the buttons at the bottom of the page (for example, **View**) to perform that action for all rows on the page.
- Constrain the columns in the display by clicking **Close** (✕) in the column heading that you want to hide. In the pop-up window that appears, click **Apply**



Note To hide or show other columns, check or clear the appropriate check boxes before you click **Apply**. To add a disabled column back to the view, click the expand arrow to expand the search constraints, then click the column name under Disabled Columns.

- Constrain the data view by selected values for selected fields. For information, refer to Event view constraints, on page 32 and Compound event view constraints, on page 34.
- Change the time constraints on the event view. The date range located in the upper right corner of the page sets a time range for events to include in the workflow. For information, refer to Event time constraints, on page 26.



Note Events that were generated outside the appliance's configured time window (whether global or event-specific) may appear in an event view if you constrain the event view by time. This may occur even if you configured a sliding time window for the appliance.

- To sort data by columns, click the name of a column. To reverse the sort order, click the column name again. The direction indicates which column the data is sorted by, and whether the sort is **Ascending** or **Descending**.
- Click a workflow page link to display that page using any active constraints. Workflow page links appear in the upper left corner of predefined workflow table views and drill-down pages, above events and below the workflow name.

Step 4 To view additional data within the current workflow, perform these steps:

- To view the file's trajectory map in a new window, click network file trajectory in file name and SHA-256 hash value columns. The icon is different depending on the file status. For more information, refer to File trajectory icons, on page 16.

- To display a pop-up window of the host profile associated with an IP address, click host profile in any IP address column. The icon is different depending on the file status. For more information, refer to Host profile icons, on page 16.
- To view the Dynamic Analysis Summary report for the highest threat score associated with a file, click threat score in any threat score column. The icon is different depending on the file's highest threat score. For more information, refer to Threat score icons, on page 17.
- To view user profile information, click **User** or, for users associated with an indication of compromise, **Red User** in any user identity column. The user icon is dimmed if that user cannot be in the database (that is, is an Secure Endpoint Connector user).
- To view vulnerability details for third-party vulnerabilities, click **Vulnerability** in any third-party vulnerability ID column.
- When viewing aggregated data points, hover your pointer over the flag to view the country name.
- When viewing individual data points, click flag to view further geolocation details described in Geolocation, on page 20.

Step 5 To view the same event type using a different workflow, click **(switch workflow)** next to the workflow title, and then choose the workflow you want to use.



Note You cannot use a different workflow for scan results.

Workflow access by user role

Access to a workflow is determined by the user's role. This table provides information about which workflows each user role can access.

User role	Accessible workflows
Administrator	Can access any workflow, and are the only users who can access the audit log, scan results, and the rule update import log.
Maintenance User	Can access health events.
Security Analyst and **Security Analyst (Read Only)**	Can access intrusion, malware, file, connection, discovery, vulnerability, correlation, and health workflows.

Workflow selection

The system provides predefined workflows for the types of data listed in this table.

Table 19: Features using workflows

Feature	Menu path	Option
Connection events	**Analysis** > **Connections**	Events
Security-related connection events	**Analysis** > **Connections**	Security-related Connection Events
Correlation events	**Analysis** > **Correlation**	Correlation Events Allow List Events Allow List Violations Status
Malware events	**Analysis** > **Files**	Malware Events
File events	**Analysis** > **Files**	File Events
Captured files	**Analysis** > **Files**	Captured Files
Host events	**Analysis** > **Hosts**	Network Map Hosts Indications of Compromise Applications Application Details Servers Host Attributes Discovery Events
Intrusion events	**Analysis** > **Intrusions**	Events Reviewed Events
User events	**Analysis** > **Users**	Active Sessions User Activity Users Indications of Compromise
Vulnerability events	**Analysis** > **Hosts**	Vulnerabilities Third-Party Vulnerabilities
Scan Results	**Policies** > **Actions** > **Scanners**	—
Health events	**System** (⚙) > **Health** > **Events**	—
Audit events	**System** (⚙) > **Monitoring** > **Audit**	Audit
Rule Update Import Log	**System** (⚙) > **Content Updates**	Rule Updates

When you view any of the kinds of data described in the table above, events appear on the first page of the default workflow for that data. You can specify a different default workflow by configuring your event view settings. Note that workflow access depends on your user role.

In a multidomain deployment, you can view data for the current domain and for any descendant domains. You cannot view data from higher level or sibling domains.

Workflow pages

Workflow pages are series of customizable data pages in Firewall Management Center that you can use to evaluate events generated by the system. They share a common set of features across all workflow types despite containing different data and allow you to perform specific actions depending on the page type.

Common workflow page features

Drill-down and table view pages in workflows allow you to quickly narrow your view of the data so you can zero in on events that are significant to your analysis. Table view pages and drill-down pages both support many features you can use to constrain the set of events you want to view or to navigate the workflow. When viewing data on drill-down pages or in the table view in a workflow, you can sort the data in ascending or descending order based on any available column. If the database contains more events than can be displayed on a single workflow page, you can click the links at the bottom of the page to display more events. When you click one of these links, the time window automatically pauses so that you do not see the same events twice; you can unpause the time window when you are ready.

In a multidomain deployment, you can view data for the current domain and for any descendant domains. You cannot view data from higher level or sibling domains.

Workflow page types:

- *Table views*: Include a column for each of the fields in the database on which your workflow is based if the page is enabled by default.
- *Drill-down pages*: Generally intermediate pages that you use to narrow your investigation to a few events before moving to a table view page.
- *Graphs*: Workflows based on connection data can include graph pages, also called connection graphs.
- *Final pages*: The final page of a workflow depends on the type of event on which the workflow is based.

Table views

- For best performance, display only the columns you need. The more columns are displayed, the more resources are required to display the data.
- When you disable a column on a table view, the system adds the Count column to the event view if disabling the column could create two or more identical rows, if no more than 6 columns are displayed (excluding the Count column).
- When you click on a value in a table view page, you constrain by that value.
- When you create a custom workflow, you add a table view to it by clicking **Add Table View**.

Drill-down pages

- Contain a subset of columns that are available in the database.

- Allow you to narrow the scope of events you are viewing and to move forward in the workflow.
- If you click on a value in a drill-down page, you constrain by that value and move to the next page in the workflow, focusing more closely on events that match your selected values.
- Clicking a value in a drill-down page does not disable the column where the value is, even if the page you advance to is a table view.
- Drill-down pages for predefined workflows always have a Count column.
- When you create a custom workflow, you add a drill-down page to it by clicking **Add Page**.

For example, a drill-down page for discovery events might include only the IP Address, MAC Address, and Time columns. A drill-down page for intrusion events, on the other hand, might include the Priority, Impact Flag, Inline Result, and Message columns.

Graphs

Workflows based on connection data can include graph pages, also called connection graphs.

For example, a connection graph might display a line graph that shows the number of connections detected by the system over time. Generally, connection graphs are, like drill-down pages, intermediate pages that you use to narrow your investigation.

Final pages

Final page types by workflow event:

- Host view: Final page for workflows based on applications, application details, discovery events, hosts, indications of compromise (IOC), servers, allow list violations, host attributes, or third-party vulnerabilities. Viewing host profiles from this page allows you to easily view data on all IP addresses associated with hosts that have multiple addresses.
- User detail view: Final page for workflows based on users, user activity, and user indications of compromise.
- Vulnerability detail view: Final page for workflows based on Cisco vulnerabilities.
- Packet view: Final page for workflows based on intrusion events.

Workflows based on other kinds of events (for example, audit log events or malware events) do not have final pages.

On the final page of a workflow, you can expand detail sections to view specific information about each object in the set you focused on over the course of the workflow. Although the web interface does not list the constraints on the final page of a workflow, previously set constraints are retained and applied to the set of data.

Workflow page navigation tools

Workflow page navigation tools are visual interface elements that facilitate movement between pages and selection of information to display during event analysis.

Workflow page traversal tools

If a workflow contains multiple pages of data, the bottom of each page displays the number of pages in the workflow, as well as the tools listed in this table which you may use to navigate among the pages:

Table 20: Workflow page traversal tools

Page traversal tool	Action
Page number (To view a different page, enter the number you wish to view, then press **Enter**.)	view a different page
>	view the next page
<	view the previous page
> |	jump to the last page
|<	jump to the first page

File trajectory icons

When a workflow page provides the opportunity to view the trajectory map for a file in a new window, a network trajectory icon appears. This icon differs depending upon the file status.

Table 21: File trajectory icons

File Trajectory Icon	File Status
Clean	Clean
Malware	Malware
Custom detection	Custom detection
Unknown	Unknown
Unavailable	Unavailable

Host profile icons

When a workflow page provides the opportunity to view the host profile associated with an IP address in a pop-up window, a host profile icon appears. If the host profile icon is dimmed, you cannot view the host profile because that host cannot be in the network map (for example, `0.0.0.0`). This icon appears different depending on the status of the host.

Table 22: Host profile icons

Host profile icon	Host status
	Host is not tagged as potentially compromised.
	Host is tagged as potentially compromised by triggered indications of compromise (IOC) rules.
	Added to Block List (Appears only if you are performing traffic filtering based on Security Intelligence data.)
	Added to Block List, set to monitor (Appears only if you are performing traffic filtering based on Security Intelligence data.)

Threat score icons

When a workflow page provides the opportunity to view a Dynamic Analysis Summary report for the highest threat score associate with a file, a threat score icon appears. The icon differs depending on the file's highest threat score.

Table 23: Threat score icons

Threat score icon	Threat score level
Low	Low
Medium	Medium
High	High
Very High	Very high

User icons

When a workflow page provides the opportunity to view the user identity associated with a username in a pop-up window, a user icon appears.

Table 24: User icons

User icon	User status
User	User is not associated with any indications of compromise.
Red User	User is associated with one or more indications of compromise.

Workflow toolbar

Each page in a workflow includes a toolbar that offers quick access to related features. This table describes each of the links on the toolbar.

Table 25: Workflow toolbar links

Feature	Description
Bookmark This Page	Bookmarks the current page so you can return to it later. Bookmarking captures the constraints in effect on the page you are viewing so you can return to the same data (assuming the data still exists) at a later time.
Report Designer	Opens the report designer with the currently constrained workflow as the selection criteria.
Dashboard	Opens a dashboard relevant to your current workflow. For example, Connection Events workflows link to the **Connection Summary** dashboard.
View Bookmarks	Displays a list of saved bookmarks from which you can select.
Search	Displays a Search page where you can perform advanced searches on data in the workflow. You can also click the down arrow icon to select and use a saved search.

Use drill-down pages

Use drill-down pages to navigate between workflow pages while applying specific constraints and filters to focus on relevant data and events. This differs from table views, which only filter the current display without navigating to subsequent pages.

Procedure

Step 1 Access a workflow by choosing the appropriate menu path and option as described in Features Using Workflows.

Step 2 In any workflow, choose from these navigation options:

- To drill down to the next workflow page constraining on a specific value, click a value within a row.
- To drill down to the next workflow page constraining on some events, check the check boxes next to the events you want to view on the next workflow page, then click **View**.
- To drill down to the next workflow page keeping the current constraints, click **View All**.

Note Clicking a value within a row in a table view only constrains the table view and does not drill down to the next page. Table views always include **Table View** in the page name.

Use table view pages

Table view pages provide some features not available on drill-down, host view, packet view, or vulnerability detail pages.

Procedure

Step 1 Access a workflow by choosing the appropriate menu path. For instructions, refer to Workflow selection, on page 12.

Step 2 Choose a table view from the workflow path displayed beneath the workflow name.

Step 3 If event data is stored remotely, you may see an option to choose whether to display local or remote data. For more information, refer to Work in Firewall Management Center with connection events stored on a Secure Network Analytics appliance, on page 19.

Step 4 Use the features listed below to arrange and navigate within the table view as needed:

- To display the list of disabled columns, click the Search Constraints **Expand Arrow** (›).
- To hide the list of disabled columns, click the Search Constraints **Collapse Arrow** (⌄).
- To add a disabled column back to the event view, click the Search Constraints **Expand Arrow** (›) to expand the search constraints, then click the column name under Disabled Columns.
- To show or hide (disable) a column, click **Clear** (⊗) next to any column name. In the pop-up window that appears, check or clear the appropriate check boxes to indicate which columns you want to display, then click **Apply**.

Work in Firewall Management Center with connection events stored on a Secure Network Analytics appliance

If your devices are sending connection events to a Secure Network Analytics appliance using Security Analytics and Logging (On Premises), you can view and work with these remotely stored events in the Firewall Management Center's event viewer and context explorer, and include them when generating reports. You can also cross-launch from an event in Firewall Management Center to view related data on your Secure Network Analytics appliance.

By default, the system automatically selects the appropriate data source based on the time range you specify. If you want to override the data source, use this procedure.

Note When you change the data source, your selection persists across all of the relevant analytics features that rely on the event data source, including reports, until you change it, even after you sign out. Your selection does not apply to other Firewall Management Center users.

The selected data source is used for low-priority connection events only. All other event types (intrusion, file, and malware events; connection events associated with those events; and Security Intelligence events) are displayed regardless of data source.

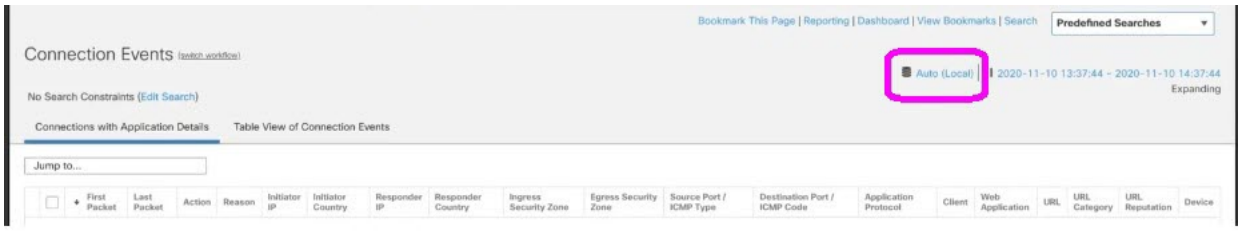
Before you begin

You have used the wizard to send connection events to Security Analytics and Logging (On Premises).

Procedure

Step 1 In the Firewall Management Center web interface, navigate to a page that displays connection event data, such as **Analysis** > **Connections** > **Events**.

Step 2 Click the data source displayed here and select an option:



Caution If you select **Local**, the system displays only the data available on the Firewall Management Center, even if local data is not available for the entire time range selected. You will not be notified that this situation is occurring.

Step 3 (Optional) To view related data directly in your Secure Network Analytics appliance, right-click (in the unified event viewer, click) a value such as an IP address or domain and choose a cross-launch option.

Geolocation

Geolocation is a database feature that maps IP addresses to geographic locations and enables viewing and filtering traffic based on country and continent by leveraging a geolocation database (GeoDB).

The system may report a continent instead of a specific country for mobile devices and other hosts detected moving from country to country. The system issues periodic updates to the GeoDB. You must regularly update the GeoDB to have accurate geolocation information. For instructions, refer to Geolocation database (GeoDB) updates.

Connection event graphs

A connection event graph is a graphical presentation tool that

- displays connection data using data aggregated over five-minute intervals
- presents information that is used for aggregating data, including source and destination IP addresses, destination port, transport protocol, and application protocol, and
- provides an alternative to tabular drill-down pages and final table views of events.

Connection graph types

There are three different types of connection graphs:

- Pie charts display data from one dataset grouped into discrete categories.
- Bar graphs display data from one or more datasets grouped into discrete categories.
- Line graphs plot data from one or more datasets over time, using either a standard or a velocity (rate of change) view.

Like workflow tables, you can drill down and constrain workflow graphs to focus your analysis.

Both bar graphs and line graphs can display multiple datasets; that is, they can display several values on the y-axis for each x-axis data point. For example, you could display the total number of unique initiators and responders. Pie charts can only display one dataset.

You can display different data on a connection graph by changing the x-axis, the y-axis, or both. On a pie chart, changing the x-axis changes the independent variable and changing the y-axis changes the dependent variable.



Note

- You cannot graph security-related connection events separately from their associated connection events. For a graphical overview of security-related connection event filtering activity, use dashboards and the **Context Explorer**.
- Firewall Management Center displays traffic profiles as line graphs, which you can manipulate in the same way as you would any other connection graph, with some restrictions. To view traffic profiles, you must have **Administrator** access.

Related Topics

Connection summaries (aggregated data for graphs)

Use connection event graphs

On the Firewall Management Center, you can view connection event graphs and manipulate them depending on the information you are looking for.

The page you see when you access connection graphs differs depending on the workflow you use. You can use a predefined workflow, which terminates in a table view of connection events. You can also create a custom workflow that displays only the information that matches your specific needs.

In a multidomain deployment, you can view data for the current domain and for any descendant domains. You cannot view data from higher level or sibling domains.

Procedure

Step 1 Choose **Analysis** > **Connections** > **Events**.



Note If a connection event table appears instead of a graph, or to view a different graph, click **(switch workflow)** by the workflow title and choose a predefined workflow that includes graphs, or a custom workflow. Note that all predefined connection event workflows—including connection graphs—terminate in a table view of connections.

Step 2 You have these options to work with the graph:

- Time Range — To adjust the time range, which is useful if the graph is blank, see Change the time window, on page 29.
- Field Names — To learn more about the data you can graph, see Connection and Security-Related Connection Event Fields.
- Host Profile — To view the host profile for an IP address, on a graph displaying connection data by initiator or responder, click either a bar on a bar graph or a wedge on a pie chart and choose **View Host Profile**.
- User Profile — To view user profile information, on a graph displaying connection data by initiator user, click either a bar on a bar graph or a wedge on a pie chart and choose **View User Profile**.
- Other Information — To learn more information about the graphed data, position your cursor over a point on a line graph, a bar in a bar graph, or a wedge in a pie chart.
- Detach — To detach a connection graph so you can perform further analysis without affecting the default time range, click **Detach**.

  Click **New Window** in a detached graph to create a copy. You can then perform different analyses on each of the detached graphs. Note that traffic profiles are detached graphs.
- Export — To export the connection data for a graph as a CSV (comma-separated values) file, **Export Data**. Then, click **Download CSV File** and save the file.

You have these options to customize and filter the data:

- Constrain — To constrain a connection graph by any x-axis (independent variable) criterion without advancing the workflow to the next page, click a point on a line graph, a bar on a bar graph, or a wedge on a pie chart, and choose a **View by...** option.
- Data Selection — To change the data displayed on the graph, click **X-Axis** or **Y-Axis** and choose the new data to graph. Note that changing the x-axis to or from **Time** also changes the graph type; changing the y-axis affects the displayed datasets.
- Datasets — To change the graph's dataset, click **Datasets** and choose a new dataset.
- Drill Down — To drill down to the next page in the workflow, click a point on a line graph, a bar on a bar graph, or a wedge on a pie chart, then choose **Drill-down**. Clicking a point on a line graph changes the time range on the next page to a 10-minute span, centered on the point you clicked. Clicking a bar on a bar graph or a wedge on a pie chart constrains the next page based on the criterion represented by the bar or wedge.

You have these graph types:

- Line — To switch between a standard and velocity (rate of change) line graph, click **Velocity**, then choose **Standard** or **Velocity**.
- Bar and Pie — To switch between a bar graph and pie chart, click **Switch to Bar** or **Switch to Pie**. Because you cannot display multiple datasets on a pie char, if you switch to a pie chart from a bar graph that has multiple datasets, the pie chart shows only one dataset, which is selected automatically. When choosing which dataset to display, the Firewall Management Center favors total statistics over initiator and responder statistics, and favors initiator statistics over responder statistics.

You have these naviagtion options:

- To navigate between pages in the current workflow, keeping the current constraints, click the appropriate page link at the top left of the workflow page.
- To navigate to other event views to view associated events, click **Jump to** and choose the event view from the drop-down list.
- To recenter a line graph around a point in time without changing the length of the time range, click that point, then choose **Recenter**.
- To recenter a line graph around a point in time while zooming in or out, click that point, choose **Zoom**, then choose a new time span.



Note Unless you are working with a detached graph, constraining, recentering, and zooming changes the default time range for the Firewall Management Center.

You can now view and manipulate connection event graphs to analyze your network data based on various criteria such as time ranges, ports, IP addresses, and application protocols.

Example: Constraining a Connection Graph

Consider a graph of connections over time. If you constrain a point on the graph by port, a bar graph appears, showing the 10 most active ports based on the number of detected connection events, but constrained by the ten-minute time span that is centered on the point you clicked.

If you further constrain the graph by clicking on one of the bars and choosing **View by Initiator IP**, a new bar graph appears, constrained by not only the same ten-minute time span as before, but also by the port represented by the bar you clicked.

Example: Changing X-Axis and Y-Axis on a Pie Chart

Consider a pie chart that graphs kilobytes per port. In this case, the x-axis is **Responder Port** and the y-axis is **KBytes**. This pie chart represents the total kilobytes of data transmitted over a monitored network during a certain interval. The wedges of the pie represent the percent of the data that was detected on each port.

- If you change the x-axis of the chart to **Application Protocol**, the pie chart still represents the total kilobytes of data transmitted, but the wedges of the pie represent the percentage of the data transmitted for each detected application protocol.
- If you change the y-axis of the chart to **Packets**, the pie chart represents the total number of packets transmitted over the monitored network during a certain interval, and the wedges of the pie represent the percentage of the total number of packets that was detected on each port.

Related Topics

Use workflows, on page 10
Configure event view settings

Connection graph data options

You can display different data on a connection graph by changing either the x-axis, the y-axis, or both. On a pie chart, changing the x-axis changes the independent variable and changing the y-axis changes the dependent variable.

Table 26: X-Axis options

X-Axis Option	Graph Type	Graphs This Data
Application Protocol	bar or pie	by the 10 most active application protocols
Device	bar or pie	by the 10 most active managed devices
Initiator IP	bar or pie	by the 10 most active initiator host IP addresses
Initiator User	bar or pie	by the 10 most active initiator users
Responder IP	bar or pie	by the 10 most active responder host IP addresses
Responder Port	bar or pie	by the 10 most active responder ports
Source Device	bar or pie	by the 10 most active NetFlow data exporters, plus a source device named **Firepower** for all connections detected by Secure Firewall System managed devices.
Time	line	over time Changing the y-axis to and from **Time** also changes the graph type and may change the datasets.

Table 27: Y-Axis options

Y-Axis Option	Graphs This Data Using The X-Axis Criterion
Bytes	bytes transmitted
Connections	number of connections
KBytes	kilobytes transmitted
KBytes Per Second	kilobytes per second
Packets	number of packets transmitted
Unique Hosts	number of unique hosts detected
Unique Application Protocols	number of unique application protocols
Unique Users	number of unique users

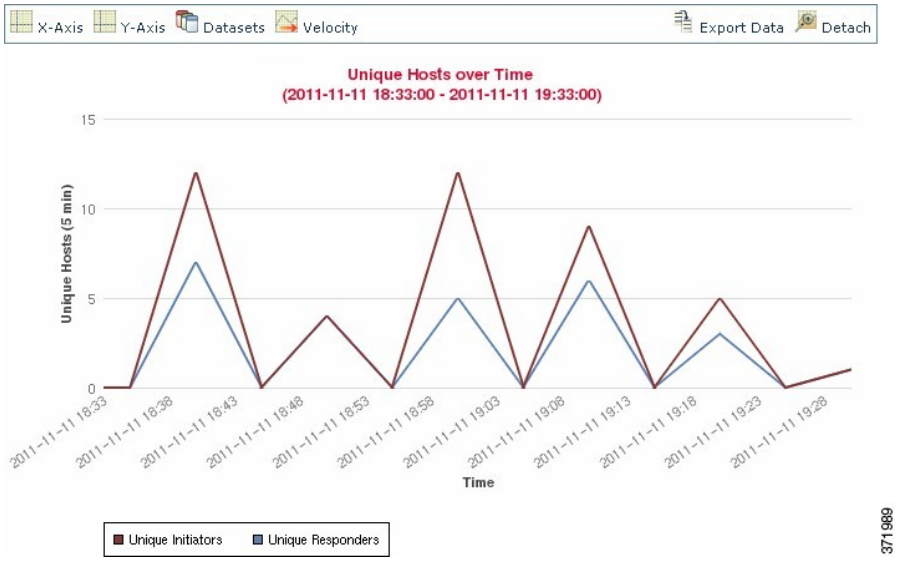
Connection graphs with multiple datasets

Connection graph with multiple datasets is an option that displays several values on the y-axis for each x-axis data point. This option is supported by both bar graphs and line graphs but not pie charts.

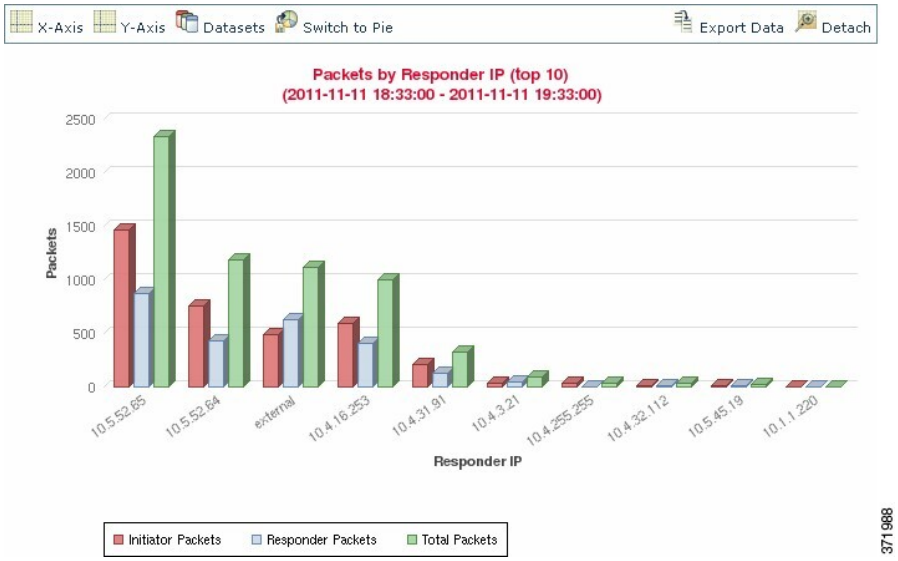
Viewing multiple dataset in connection graphs

Multiple datasets are displayed differently depending on the graph type:

- Line graphs: Multiple datasets appear as separate lines, each shown in a different color. For example, a line graph can display the total number of unique initiators and responders detected on a monitored network over a one-hour interval.



- Bar graphs: Multiple datasets appear as sets of colored bars for each x-axis data point. For example, a bar graph can display total packets transmitted, packets transmitted by initiators, and packets transmitted by responders.



You cannot display multiple datasets on a pie chart. If you switch to a pie chart from a bar graph that has multiple datasets, the pie chart shows only one dataset, which is selected automatically. When selecting which dataset to display, the Firewall Management Center favors total statistics over initiator and responder statistics, and favors initiator statistics over responder statistics.

Connection graph dataset options

This table describes the datasets you can display on the x-axis of a connection graph.

Table 28: Dataset options

If the y-axis displays...	You can select as datasets...
Connections	the default only, which is the number of connections detected on the monitored network (**Connections**). This is the only option for traffic profile graphs.
KBytes	combinations of: • the total kilobytes transmitted on the monitored network (**Total KBytes**) • the number of kilobytes transmitted from host IP addresses on the monitored network (**Initiator KBytes**) • the number of kilobytes received by host IP addresses on the monitored network (**Responder KBytes**)
KBytes Per Second	the default only, which is the total kilobytes per second transmitted on the monitored network (**Total KBytes Per Second**)
Packets	combinations of: • the total packets transmitted on the monitored network (**Total Packets**) • the number of packets transmitted from host IP addresses on the monitored network (**Initiator Packets**) • the number of packets received by host IP addresses on the monitored network (**Responder Packets**)
Unique Hosts	combinations of: • the number of unique session initiators on the monitored network (**Unique Initiators**) • the number of unique session responders on the monitored network (**Unique Responders**)
Unique Application Protocols	the default only, which is the number of unique application protocols on the monitored network (**Unique Application Protocols**)
Unique Users	the default only, which is the number of unique users logged into session initiators on the monitored network (**Unique Initiator Users**)

Event time constraints

Event time constraints are workflow filtering feature that use time stamps to indicate when events occurred and allow you to constrain information by setting time windows or time ranges.

Workflows based on events that can be constrained by time include a time range line at the top of the page.

Time window behavior

By default, workflows use an expanding time window set to the past hour. For example, if you log in at 11:30 AM, you will see events that occurred between 10:30 AM and 11:30 AM. As time moves forward, the time window expands. At 12:30 PM, you will see events that occurred between 10:30 AM and 12:30 PM.

You can change this behavior by setting your own default time window in the event view settings. This governs three properties:

- time window type (static, expanding, or sliding)
- time window length
- the number of time windows (either multiple time windows or a single global time window)

Regardless of the default time window setting, you can manually change the time window during your event analysis by clicking the time range at the top of the page. Depending on the number of time windows you configured and the type of appliance you are using, you can also use the date and time window to change the default time window for the type of event you are viewing.

Finally, you can pause the time window while looking at a sliding or expanding workflow. For more information, refer to Pause the time window to temporarily freeze the data set, on page 30.

Per-session time window customization for events

Per-session time window customization for events is a manual configuration capability that

- allows users to change the time window during event analysis sessions
- applies settings only to the current session, resetting to default when users log out and log back in, and
- affects different workflows based on the number of configured time windows on the appliance.

Time window configuration and workflow effects

Changing the time window for one workflow may affect other workflows on the appliance based on your time window configuration:

- Single, global time window: Changing the time window for one workflow changes it for all other workflows on the appliance.
- Multiple time windows: Changing the audit log or health event workflow time windows has no effect on any other time window, while changing the time window for other kinds of events affects all events that can be constrained by time (with the exception of audit events and health events).



Note Manual time window settings are valid for only the current session. When you log out and then log back in, time windows are reset to the default.

Time window settings have no effect on workflows based on hosts, host attributes, applications, application details, vulnerabilities, users, or allow list violations because not all workflows can be constrained by time.

Use the time window tab on the date and time window to manually configure a time window. Depending on the number of time windows you configured in your default time window settings, the tab's title is one of these:

- **Events Time Window**, if you configured multiple time windows and are setting the time window for a workflow other than the audit log or health events workflow
- **Health Monitoring Time Window**, if you configured multiple time windows and are setting the time window for the health events workflow
- **Audit Log Time Window**, if you configured multiple time windows and are setting the time window for the audit log
- **Global Time Window**, if you configured a single time window

The first decision you must make when configuring a time window is the type of time window you want to use:

- A static time window displays all the events generated from a specific start time to a specific end time.
- An expanding time window displays all the events generated from a specific start time to the present; as time moves forward, the time window expands and new events are added to the event view.
- A sliding time window displays all the events generated from a specific start time (for example, one week ago) to the present; when you refresh the page, the time window slides so that you see only the events in the time range you configured (in this example, for the last week). To temporarily prevent the data set from updating while you are examining it, see Pause the time window to temporarily freeze the data set, on page 30.

Depending on what type you select, the Date/Time window changes to give you different configuration options.

Note The system uses a 24-hour clock based on the time you specified in your time zone preferences.

Time window settings

This table explains the various settings you can configure on the Time Window tab.

Table 29: Time window settings

Setting	Time window type	Description
time window type drop-down list	n/a	Select the type of time window you want to use: static, expanding, or sliding. Note that events that were generated outside the appliance's configured time window (whether global or event-specific) may appear in an event view if you constrain the event view by time. This may occur even if you configured a sliding time window for the appliance.
Start Time calendar	static and expanding	Specify a start date and time for your time window. The maximum time range for all time windows is from midnight on January 1, 1970 (UTC) to 3:14:07 AM on January 19, 2038 (UTC). Instead of using the calendar, you can use the Presets options, described below.

Setting	Time window type	Description
End Time calendar	static	Specify an end date and time for your time window. The maximum time range for all time windows is from midnight on January 1, 1970 (UTC) to 3:14:07 AM on January 19, 2038 (UTC). Note that if you are using an expanding time window, the End Time calendar is grayed out and specifies that the end time is "Now." Instead of using the calendar, you can use the Presets options, described below.
Show the Last field and drop-down list	sliding	Configure the length of the sliding time window.
Presets: Last	all	Click one of the time ranges in the list to change the time window, based on the local time of the appliance. For example, clicking **1 week** changes the time window to reflect the last week. Clicking a preset changes the calendars to reflect the preset you choose.
Presets: Current	static and expanding	Click one of the time ranges in the list to change the time window, based on the local time and date of the appliance. Clicking a preset changes the calendars to reflect the preset you choose. Note that: • the current day begins at midnight • the current week begins at midnight Sunday • the current month begins at midnight on the first of the month
Presets: Synchronize with	all (not available if you are using a global time window)	Click one of: • **Events Time Window** to synchronize the current time window with the events time window • **Health Monitoring Time Window** to synchronize the current time window with the health monitoring time window • **Audit Log Time Window** to synchronize the current time window with the audit log time window

Change the time window

Change the time window settings for workflows that are constrained by specific time parameters.

Procedure

Step 1 On a workflow constrained by time, click **Time Range** ( ) to go to the date and time window.

Step 2 On **Events Time Window**, set the time window. For instructions, refer to Time window settings, on page 28.

To change the time window back to the default settings, click **Reset**.

Step 3 Click **Apply**.

Pause the time window to temporarily freeze the data set

Pausing the time window allows you to examine a snapshot of the data provided by the workflow without interference from automatic updates.

When an unpaused workflow updates, it may remove events that you want to examine or add events that you are not interested in.

The time window automatically pauses when you click a link at the bottom of the page to display another page of events. When you are finished with your analysis, you can unpause the time window. Unpausing the time window updates it according to your preferences, and also updates the event view to reflect the unpaused time window.

Pausing an event time window has no effect on dashboards, nor does pausing a dashboard have any effect on pausing an event time window.

Procedure

Step 1 Access a workflow that is constrained by time. For instructions, refer to Workflow selection, on page 12.

Step 2 Choose the desired time range control:

- To pause the time window, click time range control **Pause** ( ).
- To unpause the time window, click time range control **Play** ( ).

Default time window for events

A default time window for events is a configurable time range setting that determines the initial time period displayed for event analysis.

During your event analysis, you can use the **Preferences** tab on the date and time window to change the default time window for the type of event you are viewing.

Default time window configuration

The scope of default time window changes depends on your configuration:

- Multiple time windows: Changing the default time window on the **Preferences** tab changes the settings for only the type of event you are viewing (events, health monitoring, or audit log window), specifically whichever time window is indicated by the first tab.
- Single time window: Changing the default time window on the **Preferences** tab changes the default time window for all types of events.

Default time window options for event types

This table explains the various settings you can configure on the **Preferences** tab.

Table 30: Time window preferences

Preference	Description
Refresh Interval	Sets the refresh interval for event views, in minutes. Entering zero disables the refresh option.
Number of Time Windows	Specify how many time windows you want to use: • Select **Multiple** to configure separate default time windows for the audit log, for health events, and for workflows based on events that can be constrained by time. • Select **Single** to use a global time window that applies to all events.
Default Time Window: Show the Last - Sliding	This setting allows you to configure a sliding default time window of the length you specify. The appliance displays all the events generated from a specific start time (for example, 1 hour ago) to the present. As you change event views, the time window "slides" so that you always see events from the last hour.
Default Time Window: Show the Last - Static/Expanding	This setting allows you to configure either a static or expanding default time window of the length you specify. For **static** time windows (enable the **Use End Time** check box), the appliance displays all the events generated from a specific start time (for example, 1 hour ago), to the time when you first viewed the events. As you change event views, the time window stays fixed so that you see only the events that occurred during the static time window. For **expanding** time windows (disable the **Use End Time** check box), the appliance displays all the events generated from a specific start time (for example, 1 hour ago), to the present. As you change event views, the time window expands to the present time.
Default Time Window: Current Day - Static/Expanding	This setting allows you to configure either a static or expanding default time window for the current day. The current day begins at midnight, based on the time zone setting for your current session. For **static** time windows (enable the **Use End Time** check box), the appliance displays all the events generated from midnight to the time when you first viewed the events. As you change event views, the time window stays fixed so that you see only the events that occurred during the static time window. For **expanding** time windows (disable the **Use End Time** check box), the appliance displays all the events generated from midnight to the present. As you change event views, the time window expands to the present time. Note that if your analysis continues for over 24 hours before you log out, this time window can be more than 24 hours.

Preference	Description
Default Time Window: Current Week - Static/Expanding	This setting allows you to configure either a static or expanding default time window for the current week. The current week begins at midnight on the previous Sunday, based on the time zone setting for your current session. For **static** time windows (enable the **Use End Time** check box), the appliance displays all the events generated from midnight to the time when you first viewed the events. As you change event views, the time window stays fixed so that you see only the events that occurred during the static time window. For **expanding** time windows (disable the **Use End Time** check box), the appliance displays all the events generated from midnight Sunday to the present. As you change event views, the time window expands to the present time. Note that if your analysis continues for over 1 week before you log out, this time window can be more than 1 week.

Change the default time window for your event type

Change the default time window settings to customize how time-constrained workflows display events within your preferred time range.

Procedure

Step 1 On a workflow constrained by time, click **Time Range** ( ) to go to the date and time window.

Step 2 Click **Preferences** and change your preferences. For instructions, refer to Default time window options for event types, on page 31.

Step 3 Click **Save Preferences**.

Step 4 Choose one of the following options:

- To apply your new default time window settings to the event view you are using, click **Apply** to close the date and time window and refresh the event view.
- To continue with your analysis without applying the default time window settings, close the date and time window without clicking **Apply**.

Event view constraints

Event view constraints are filtering options in workflow pages that determine the information displayed on workflow pages based on imposed constraints. When you initially open an event workflow, the information is constrained to events that were generated in the previous hour.

- allow users to refine data visibility through multiple constraint methods.

Constraint methods

Use these methods for constraining data in event workflows:

- To advance to the next page in the workflow and constrain the data you are viewing by specific values, select the rows with those values on the page and click **View**.

Note If you select a row with multiple non-count values and click **View**, you create a compound constraint.

- To advance to the next page in the workflow retaining the current constraints and carrying forward all events, select **View All**.
- To constrain the page to the rows with values that you selected and also add the selected value to the list of constraints at the top of the page, click a value within a row on the page.

If you are viewing a list of logged connections and want to constrain the list to only those you allowed using access control, click **Allow** in the **Action** column.

As another example, if you are viewing intrusion events and want to constrain the list to only events where the destination port is 80, click **80 (http)/tcp** in the **Destination Port/ICMP Code** column.

Note The procedure for constraining connection events based on Monitor rule criteria is slightly different and you may need to take some extra steps. Additionally, you cannot constrain connection events by associated file or intrusion information.

Use searches to contrain data

You can also use searches to constrain the information in a workflow. Use this feature when you want to constrain against multiple values in a single column. For example, if you want to view the events related to two IP addresses, click **Edit Search**, then modify the appropriate IP address field on the Search page to include both addresses, and then click **Search**.

The search criteria you enter on the search page are listed as the constraints at the top of the page, with the resulting events constrained accordingly. On the Firewall Management Center, the current constraints are also applied when navigating to other workflows, unless they are compound constraints.

When searching, you must pay careful attention to whether your search constraints apply to the table you are searching. For example, client data is not available in connection summaries. If you search for connection events based on the detected client in the connection and then view the results in a connection summary event view, the Firewall Management Center displays connection data as if you had not constrained it at all. Invalid constraints are labeled as not applicable (N/A) and are marked with a strikethrough.

Constrain events

Constraining events help you narrow down large datasets in workflows by applying filters based on specific values or combinations of values. You can save these constraints for reuse and apply them across different event views.

Procedure

Step 1 Access a workflow by choosing the appropriate menu path. For instructions, refer to Workflow selection, on page 12.

Step 2 Apply event constraints using these options:

- To constrain the view to events that match a single value, click the desired value within a row on the page.
- To constrain the view to events that match multiple values, check the check boxes for events with those values, and click **View**.

Note A compound constraint is added if the row contains multiple non-count values.

- To remove a constraint, click the Search Constraints **Expand Arrow** (›) and click the name of the constraint in the expanded Search Constraints list.
- To edit constraints using the Search page, click **Edit Search.**
- To save constraints as a saved search, click **Save Search** and give the query a name.

Note You cannot save queries containing compound constraints.

- To use the same constraints with another event view, click **Jump to** and choose the event view.

Note You do not retain compound constraints when you switch to another workflow.

- To toggle the display of constraints click the Search Constraints **Expand Arrow** (›) or the Search Constraints **Collapse Arrow** (⌄). This is useful when the list of constraints is large and takes up most of the screen.

Compound event view constraints

A compound event view constraint is a filtering option that retrieves events based on all non-count values for a specific event. When you select a row with multiple non-count values, this option allows you to set constraints that match all the non-count values in that row on that page.

How compound constraints work

When you select a row that has a source IP address of `10.10.31.17` and a destination IP address of `10.10.31.15` and a row that has a source IP address of `172.10.10.17` and a destination IP address of `172.10.10.15`, you retrieve all of this:

- Events that have a source IP address of 10.10.31.17 and a destination IP address of 10.10.31.15

  OR

- Events that have a source IP address of 172.10.31.17 and a destination IP address of 172.10.31.15

When you combine compound constraints with simple constraints, the simple constraints are distributed across each set of compound constraints. If, for example, you added a simple constraint for a protocol value of `tcp` to the compound constraints listed above, you retrieve all of this:

- Events that have a source IP address of 10.10.31.17 and a destination IP address of 10.10.31.15 and a protocol of `tcp`, or
- events that have a source IP address of 172.10.31.17 and a destination IP address of 172.10.31.15 and a protocol of `tcp`.

You cannot perform a search or save a search on a compound constraint. You also cannot retain compound constraints when you use the event view links or click **(switch workflow)** to switch to another workflow. If you bookmark an event view with compound constraints applied, the constraints are not saved with the bookmark.

Use compound event view constraints

Compound constraints allow you to filter workflow data by selecting multiple rows with non-count values, providing more refined data analysis capabilities.

Procedure

Step 1 Access a workflow by choosing the appropriate menu path. For instructions, refer to Workflow selection, on page 12.

Step 2 To manage compound constraints, you have these options:

- To create a compound constraint, choose one or more rows with multiple non-count values and click **View**.
- To clear compound constraints, click the Search Constraints **Expand Arrow** (›) and click **Compound Constraints**.

Navigate between workflows

The **Jump to...** drop-down list on a workflow page is a feature that enables you to navigate between different workflows. It transfers applicable shared properties and constraints from selected rows to the new workflow, and enhances investigation capabilities by allowing correlation of data across different workflows.

Navigation behavior and constraints

When you select a new workflow, properties shared by the rows you select and the constraints you set are used in the new workflow, if they are applicable. If configured constraints or event properties do not map to fields in the new workflow, they are dropped. In addition, compound constraints are not retained when you switch from one workflow to another. In addition, constraints from the captured files workflow only transfer to file and malware event workflows.



Note

- When you view event counts over a time range, the total number of events may not reflect the number of events for which more detailed data is available. This occurs because the system sometimes prunes older event details to manage disk space usage. To minimize the occurrence of event detail pruning, you can fine-tune event logging to log only those events most important to your deployment.
- Unless you have either paused the time window or have configured a static time window, the time window changes when you change workflows.

Security investigation workflow

This feature enhances your ability to investigate suspicious activity. For example, if you are viewing connection data and notice that an internal host is transmitting an abnormally large amount of data to an external site, you can select the responder IP address and the port as constraints and then jump to the **Applications** workflow. The applications workflow will use the responder IP address and port as IP Address and Port constraints and display additional information about the application, such as what kind of application it is. You can also click **Hosts** at the top of the page to view the host profile for the remote host.

After finding more information about the application, you can select **Correlation Events** to return to the connection data workflow, remove the Responder IP from the constraints, add the Initiator IP to constraints, and select **Application Details** to see what client the user on the initiating host used when transferring data to the remote host. Note that the Port constraint is not transferred to the Application Details page. While keeping the local host as a constraint, you can also use other navigation buttons to find additional information:

- To discover if any policies have been violated by the local host, keep the IP address as a constraint and select **Correlation Events** from the **Jump to** drop-down list.
- To find out if an intrusion rule triggered against the host, indicating a compromise, select **Intrusion Events** from the **Jump to** drop-down list.
- To view the host profile for the local host and determine if the host is susceptible to any vulnerabilities that may have been exploited, select **Hosts** from the **Jump to** drop-down list.

Work with the unified event viewer

Unified Events provide you a single-screen view of multiple types (connection, intrusion, file, malware, and some security-related connection events) of firewall events. The Unified Events table is highly customizable. You can create and apply custom filters to fine-tune the information displayed on the event viewer. The **Live**

View option in the unified events table lets you see the firewall events in real time and monitor the activity on your network.

Procedure

Step 1 Choose **Analysis** > **Unified Events**.

Step 2 Select a time range (fixed or sliding) to view the firewall events from a specific period. By default, unified event viewer table displays events from the previous hour. You can filter the table to get more granular context of the security event, customize the table columns, or enable live view and see the event updates in real time.

For more information on Unified Events, see Unified Events.

Bookmarks

The bookmarks option is a workflow navigation feature that

- enables you to save a specific location and time in an event analysis, and
- allows quick return to the saved point for further investigation.

You can share a bookmark with other users who have bookmark access. This is useful when you identify events that require detailed analysis and need to turn over the investigation to another user with the appropriate privileges.

Bookmark information retention

Bookmarks retain information about:

- the workflow you are using
- the part of the workflow you are viewing
- the page number within the workflow
- any search constraints
- any disabled columns
- the time range you are using

Note If the events saved under a bookmark are deleted, either by a user or due to automatic database cleanup, the bookmark does not display the original set of events.

Create bookmarks

Create bookmarks to save specific event analysis views and configurations for quick access in future sessions.

In a multidomain deployment, you can only view bookmarks created in the current domain.

Procedure

Step 1 During an event analysis, with the events of interest displayed, click **Bookmark This Page**.

Step 2 In the **Bookmark Name** field, enter a name.

Step 3 Click **Save Bookmark**.

View bookmarks

View bookmarks to quickly access previously saved event views and filter configurations.

In a multidomain deployment, you can only view bookmarks created in the current domain.

Procedure

Step 1 Access a workflow page. For instructions, refer to Workflow selection, on page 12.

Step 2 From any event view, you have two options:

- Hover your pointer over **View Bookmarks**, and click on the desired bookmark in the drop-down menu.
- Click on click **View Bookmarks** and on the View Bookmarks page, click on the desired bookmark name or **View** ( ) next to it.

Note If the events that originally appeared in a bookmark are deleted (either directly by a user or by automatic database cleanup), the bookmark no longer displays the original set of events.

History for workflows

This table provides a comprehensive history of workflow-related features, including deprecated functionality, new capabilities, and improvements introduced across Firewall Management Center software versions.

Table 31: Workflow feature history

Feature	Minimum Firewall Management Center	Minimum Firewall Threat Defense	Details
Deprecated: intrusion incidents and event clipboard	7.1	Any	Intrusion incidents and event clipboard are deprecated. Deprecated screens: • **Analysis** > **Intrusions** > **Clipboard** • **Analysis** > **Intrusions** > **Incidents**
Unified event viewer.	7.0	Any	View and work in a single table with multiple event types: connection (including security-rekated connection), intrusion, file, and malware. New/modified screens: **Analysis** > **Unified Events**
Work with events stored remotely.	7.0	Any	Use Firewall Management Center to work with connection events stored on a Secure Network Analytics appliance. The system automatically uses the most appropriate data source, or you can explicitly choose the source. This option appears only if you have completed the Security Analytics and Logging (On Premises) wizard. New/modified screens: pages that display connection events, for example, the event viewer, dashboard, context explorer, and reports.
Improved loading speed of workflow tables in certain cases.	6.6	Any	Tables on workflow pages now show a **Count** column for rows that are identical only when no more than six columns are displayed. This minimizes the amount of calculation required and thus improves table loading speed. New/modified screens: Any events table.