Monitoring and Reporting Change Logs, Workflows, and Jobs

CDO effectively monitors configuration change logs, bulk device operations, and the process that runs when communicating with devices. This helps you understand how your network's existing policies influence its security posture.

Manage Change Logs in CDO

A Change Log captures the configuration changes made in CDO, providing a single view that includes changes in all the supported devices and services. These are some of the features of the change log:

- Provides a side-by-side comparison of changes made to device configuration.
- Provides labels for all change log entries.
- Records onboarding and removal of devices.
- Detects policy change conflicts occurring outside CDO.
- Provides answers about who, what, and when during an incident investigation or troubleshooting.
- Enables downloading of the complete change log, or only a portion of it, as a CSV file.

Manage Change Log Capacity

CDO retains the change log information for one year and deletes data older than a year.

There is a difference between the change log information stored in CDO's database and what you see in an exported change log. See Export the Change Log, on page 5 for more information.

Change Log Entries

A change log entry reflects the changes to a single device configuration, an action performed on a device, or the change made to a device outside CDO:

- For change log entries that contain configuration changes, you can view details about the change by clicking anywhere in the corresponding row.
- For out-of-band changes made outside CDO and are detected as conflicts, the **System User** is reported as the **Last User**.
- CDO closes a change log entry after a device's configuration on CDO is synced with the configuration on the device, or when a device is removed from CDO. Configurations are considered to be in sync after they read the configuration from the device to CDO or after deploying the configuration from CDO to the device.
- CDO creates a new change log entry immediately after completing an existing entry, irrespective of whether the change was a success or failure. Additional configuration changes are added to the new change log entry that opens.
- Events are displayed for read, deploy, and delete actions for a device. These actions close a device's change log.
- A change log is closed after CDO is in sync with the configuration on the device (either by reading or deploying), or when CDO no longer manages the device.
- If a change is made to the device outside of CDO, a *Conflict detected* entry is included in the change log.

Pending and Completed Change Log Entries

Change logs have a status of either Pending or Completed. As you make changes to a device's configuration using CDO, these changes are recorded in a Pending change log entry. The following activities complete a Pending change log, and after this a new change log is created for recording future changes.

- Reading a configuration from a device to CDO
- Deploying changes from CDO to a device
- Deleting a device from CDO
- Running a CLI command that updates the running configuration file

The following image is a Pending change log entry in an ASA. This is denoted by the open circle next to the timestamp.

Search and Filter Change Log Entries

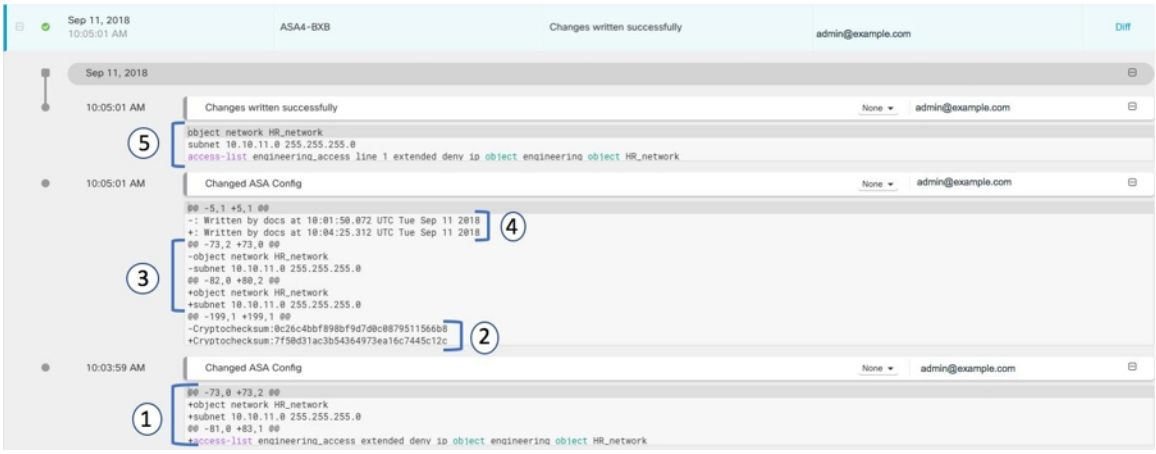
You can search and filter change log entries. Use the search field to find events. Use the filter ( ) to find the entries that meet the criteria you specify. You can also combine the two tasks by filtering the change log and adding a keyword to the search field to find an entry within the filtered results.

Change Log Entries after Deploying to an ASA

A checkmark on the header indicates that the change log is complete. The change log displays the most recent entries first followed by the older entries below in a chronological order. You can sort these entries.

Click the View Change Log Differences link in the change log entry row to view a side-by-side comparison of the changes in the context of the running configuration file.

The explanations for the different changes are shown below.

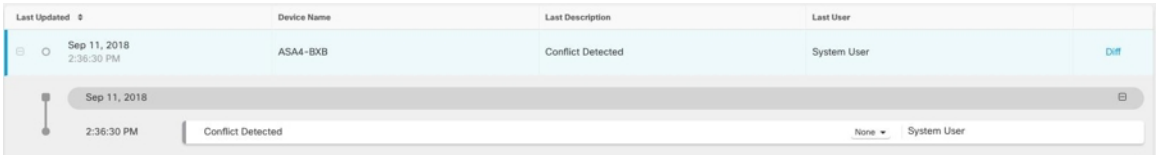


Number in illustration	Explanation
1	This is the change that admin@example.com made at 10:03:59 AM on September 11, 2018. **1.** The "HR_network" object was added. **2.** The initial network address (10.10.11.0) and subnet mask (255.255.255.0) were added to the I object. **3.** A rule was added to the "engineering_access" network policy denying addresses in the "engineer from reaching the "HR_network"
2	The checksum of the running configuration file was recalculated by the ASA and changed. The ol *removed* and the new value was *added*.
3	The ASA moves the object to a different location in the running configuration file than where Cis Orchestrator placed it. **Note** You don't always see this kind of an entry.

Number in illustration	Explanation
4	The record of the last time the running configuration file was updated. The old timestamp is removed new timestamp is added. This change was made by the ASA.
5	These are the commands sent by Cisco Defense Orchestrator to the ASA to make the configuration cl

Change Log Entries After Reading Changes from an ASA

When CDO detects a change on an ASA that it manages, it opens a change log entry and records the time when the configuration conflict was detected. You see this change log entry when CDO detects a conflict:



If you accept the changes, or review and accept the changes, that change is added to the change log entry and the entry is completed.

This entry shows the Conflict Detected change and the deletion of a rule that prevents addresses in the engineering network from reaching the HR_network. The change log entry also shows a change with the message *Successfully imported out-of-band changes.* If the admin chooses to reject the out-of-band change, the change log will display the message *Successfully rejected out-of-band changes on the device* along with what was rejected. Out-of-band changes refers to the changes made to the ASA device directly without using CDO.

Related Topics

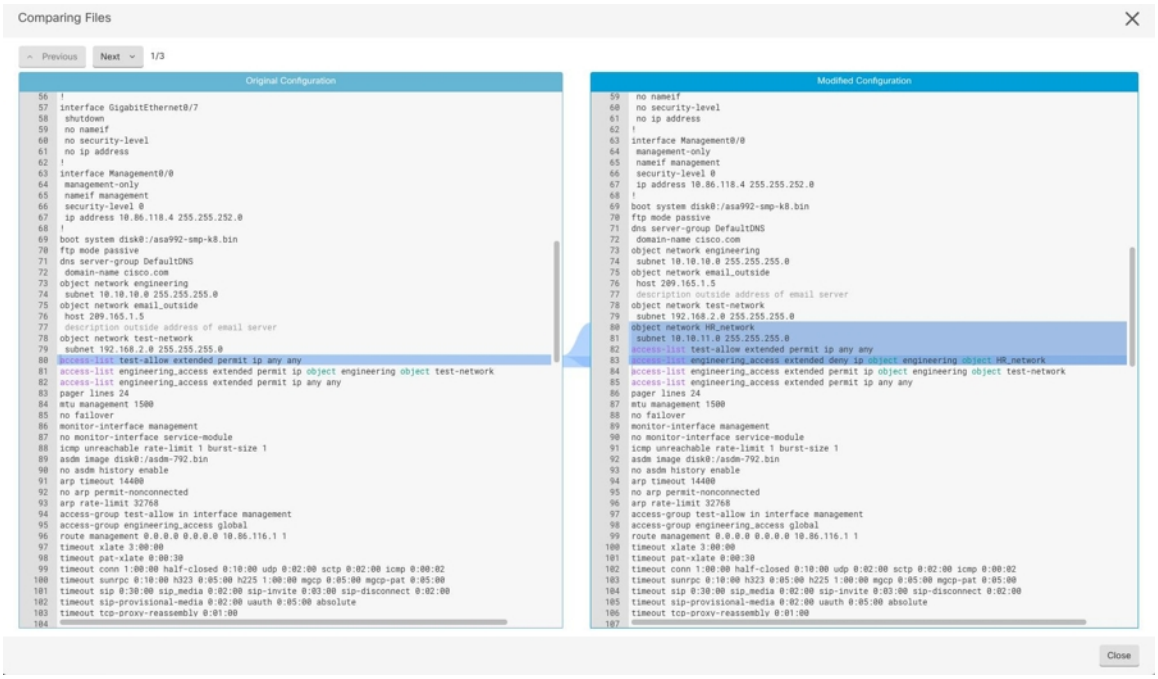
- Manage Change Logs in CDO, on page 1
- Change Log Entries after Deploying to an ASA, on page 3
- View Change Log Differences, on page 5
- Reading, Discarding, Checking for, and Deploying Configuration Changes

View Change Log Differences

Click **Diff** in the change log to open up a side-by-side comparison of the changes in the running configuration file of the device.

In the following figure, the **Original Configuration** column is the running configuration file before a change was written to the ASA. The **Modified Configuration** column shows the running configuration file after the change was written. In this case, the **Original Configuration** column highlights a row in the running configuration file; this row doesn't change, but gives you a point of reference in the **Modified Configuration** column.

Follow the lines across from the left to the right column to see the addition of the *HR_network* object and the access rule preventing addresses in the *engineering* network to reach addresses in the *HR_network* network. Click **Previous** and **Next** to move through the changes in the file.



Related Topics

- Manage Change Logs in CDO, on page 1

Export the Change Log

You can export all or a subset of the CDO change log to a comma-separated value (.csv) file so that you can filter and sort the information, as required.

To export the change log to a .csv file, follow this procedure:

Step 1 In the left pane, click **Change Log**.

Step 2 Find the changes you want to export by doing one of the following tasks:

- Use the filter ( ) and the search field to find what you want to export. For example, filter by device to see only the changes for your selected device or devices.
- Clear all the filters and search criteria in the change log. This allows you to export the entire change log.

Note CDO retains 1 year of change log data. It is recommended to filter the change log contents and download the results ot a .csv file rather than downloading the entire change log history for a year.

Step 3 Click the export icon at the top right corner of the page.

Step 4 Save the .csv file to your local file system, with a descriptive name.

Differences Between Change Log Capacity in CDO and Size of an Exported Change Log

The information that you export from CDO's Change Log page is different from the change log information that CDO stores in its database.

For every change log, CDO stores two copies of the device's configuration–the *starting* configuration and either the *ending* configuration in the case of a closed change log or the *current* configuration in the case of an open change log. This allows CDO to display configuration differences side by side. In addition, CDO tracks and stores every step (*change event*) with the username that made the change, the time the change was made, and other details.

However, when you export the change log, the export does not include the two complete copies of the configuration. It only includes the *change events*, which makes the export file much smaller than the change log that CDO stores.

CDO stores change log information for a year. This includes two copies of the configuration.

Change Request Management

Change Request Management enables the linking of a **Change Request** and its business justification to a **Change Log** event. The **Change Request** is opened in a third-party ticketing system.

Use **Change Request Management** to create a **Change Request** in CDO and associate it with change log events. You can search for this change request by **Name** within the change log.

Note In CDO, **Change Request Tracking** and **Change Request Management** refer to the same functionality.

Enable Change Request Management

Enabling change request tracking affects all users of your tenant.

Step 1 In the left pane, click **Settings** > **General Settings**.

Step 2 Enable the **Change Request Tracking** toggle button.

When enabled, the **Change Request** menu appears at the bottom-left corner and the **Change Request** drop-down list is available in the **Change Log** page.

Create a Change Request

Step 1 In CDO, click the **Create Change Request** (+) icon in the **Change Request** menu at the bottom-left corner.

Step 2 Enter a **Name** and **Description**.

Ensure that the **Name** corresponds to a **Change Request** name that your organization intends to use, and that the **Description** describes the purpose of the change.

Note You cannot modify the name of a **Change Request** after you create it.

Step 3 Click **Save**.

Note When a **Change Request** is saved, CDO associates all the new changes with the corresponding **Change Request** name. This association continues until you either Disable Change Request Management or Clear the Change Request Toolbar from the menu.

Associate a Change Request with a Change Log Event

Step 1 In the left pane, click **Change Log**.

Step 2 Expand the change log to view the events you want to associate with a **Change Request**.

Step 3 Click the drop-down list adjacent to the corresponding change log entry.

Note The latest change requests are displayed at the top of the change request list.

Step 4 Select a change request and click **Select**.

Search for Change Log Events with Change Requests

Step 1 In the left pane, click **Change Log**.

Step 2 In the change log search field, enter the name of a change request to find the associated change log events.

CDO highlights the change log events that are exact matches.

Search for a Change Request

Step 1 In CDO, click the **Create Change Request** (+) icon in the **Change Request** menu at the bottom-left corner.

Step 2 Enter the name of the **Change Request** or a relevant keyword in the search field. As you enter a value, the results that partially match your input, appear in both the **Name** and **Description** fields.

Filter Change Requests

Step 1 In the left pane, click **Change Log**.

Step 2 Click the filter icon to view all the options.

Step 3 In the search field, enter the name of a **Change Request**.

As you enter a value, the results that partially match your entry appear.

Step 4 Select a change request by checking the corresponding check box.

The matches appear in the **Change Log** table. CDO highlights the change log events that are exact matches.

Clear the Change Request Toolbar

To avoid automatic association of change log events with an existing change request, clear the information in the change request toolbar.

Step 1 In CDO, click the **Create Change Request** (+) icon in the **Change Request** menu at the bottom-left corner.

Step 2 Click **Clear**.

The **Change Request** menu now displays **None**.

Clear a Change Request Associated with a Change Log Event

Step 1 In the left pane, click **Change Log**.

Step 2 Expand the **Change Log** to view the events that you want to disassociate from **Change Requests**.

Step 3 Click the drop-down list adjacent to the corresponding change log entry.

Step 4 Click **Clear**.

Delete a Change Request

Deleting a **Change Request** removes it from the change request list, but not from the **Change Log**.

Step 1 Click the **Create Change Request** (+) icon in the **Change Request** menu at the bottom-left corner.
Step 2 Select the change request and click the bin icon to delete it.
Step 3 Click the check mark to confirm.

Disable Change Request Management

Disabling **Change Request Management** or **Change Request Tracking** affects all users of your account.

Step 1 In the left pane, click **Settings** > **General Settings**.
Step 2 Disable the **Change Request Tracking** toggle button.

Change Request Management Use Cases

These use cases assume that you have enabled Change Request Management.

Track Changes Made to the Firewall Device to Resolve a Ticket Maintained in an External System

This use case describes a scenario where you want to make changes to a firewall device to resolve a ticket maintained in an external system and want to associate the change log events resulting from these firewall changes to a change request. Follow this procedure to create a change request and associate change log events to it:

1. Create a Change Request, on page 7.
2. Use the ticket name or number from the external system as the name of the change request and add the justification for the change and other relevant information in the **Description** field.
3. Ensure that the new change request is visible in the change request toolbar.
4. Make the changes to the firewall device.
5. In the navigation pane, click **Change Log** and find the change log events that are associated with your new change request.
6. Clear the Change Request Toolbar, on page 8 to avoid automatic association of change log events with an existing change request.

Manually Update Individual Change Log Events After Changes are Made to the Firewall Device

This use case describes a scenario where you have made changes to a firewall device to resolve a ticket that is maintained in an external system, but forgot to use the Change Request Management feature to associate change requests with the change log events. You want to update the change log events with the ticket number. Follow this procedure to associate change requests with change log events:

1. Create a Change Request, on page 7. Use the ticket name or number from the external system as the name of the change request. Use the **Description** field to add the justification for the change and other relevant information.
2. In the navigation pane, click **Change Log** and search for the change log events that are associated with the changes.
3. Associate a Change Request with a Change Log Event, on page 7.
4. Clear the Change Request Toolbar, on page 8 to avoid automatic association of change log events with an existing change request.

Search for Change Log Events Associated with a Change Request

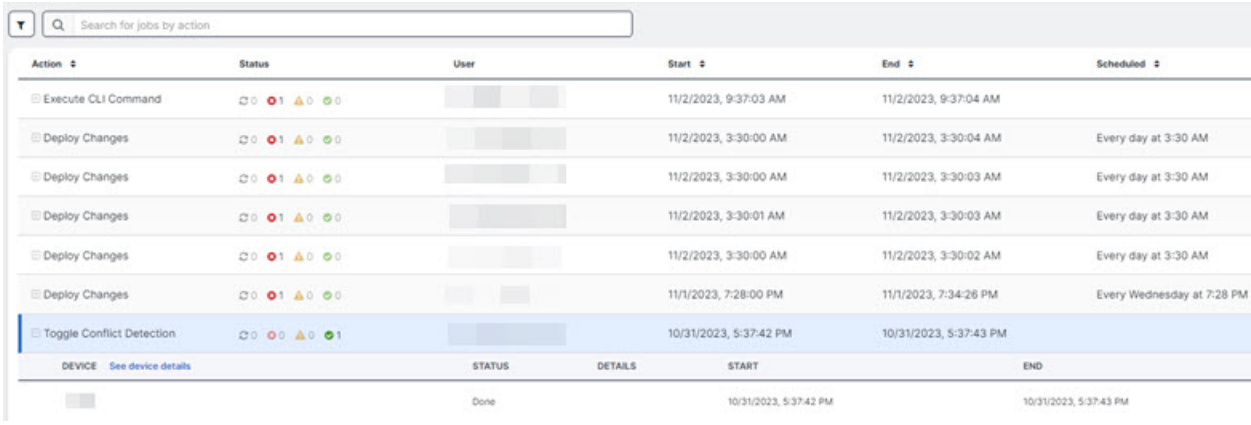
This use case describes a scenario where, you want to find out what change log events were recorded in the change log because of the work done to resolve a ticket maintained in an external system. Follow this procedure to search for change log events that are associated with a change request:

1. In the navigation pane, click **Change Log.**
2. Search for change log events that are associated with change requests using one of the following methods below:
   - In the **Change Log** search field, enter the exact name of the change request to find change log events associated with that change request. CDO highlights change log events that are exact matches.
   - Filter Change Requests, on page 8 to find the change log events.
3. View each change log to find the highlighted change log events showing the associated change request.

Monitor Jobs in CDO

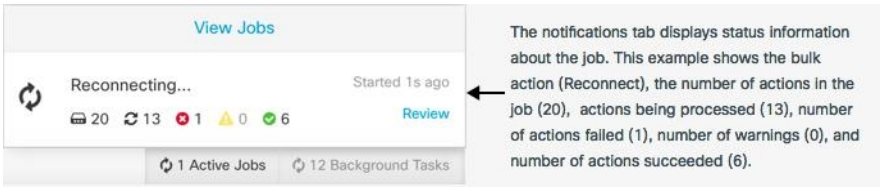
The **Jobs** page provides an overview of the progress of bulk operations, such as reconnecting multiple devices, reading configurations from multiple devices, or upgrading multiple devices simultaneously. The **Jobs** table uses color-coded rows along with the status of individual actions, indicating if they have succeeded or failed.

One row in the table represents a single bulk operation. This one bulk operation may have been, for example, an attempt to reconnect 20 devices. Expanding a row in the **Jobs** page displays the results for each of the devices affected by the bulk operation.



You can reach the **Jobs** page in two different ways:

- In the **Notifications** tab, when there is a new Job notification, click the **Review** link. You will be redirected to the **Jobs** page and see the specific job represented by the notification.



- From CDO, select **Jobs**. This table shows a complete list of the bulk actions performed in CDO.

Search Jobs in CDO

When you're on the **Jobs** page, you can filter and search by different actions, the users who performed them, and the action status.

Reinitiate a Bulk Action

After reviewing the **Jobs** page, if you find that one or more actions in a bulk action have failed, you can retry the bulk action after making the necessary corrections.. Note that CDO will re-run the job only for the failed actions. To re-run a bulk action:

Step 1 In the **Jobs** page. select the row that indicates a failed action.

Step 2 Click the **Retry**( ) icon.

Cancel a Bulk Action

You can cancel the bulk actions that are currently in progress on multiple devices. For example, if you have tried to reconnect four managed devices, and three of them have successfully reconnected, but the fourth device is still neither connected nor disconnected, you can cancel the bulk action.

To cancel a bulk action:

Step 1 On the CDO navigation menu, click **Jobs**.

Step 2 Identify the running bulk action and click the **Cancel** link on the right side.

Note If any part of the bulk action is successful, it cannot be undone. Any ongoing action will be cancelled.

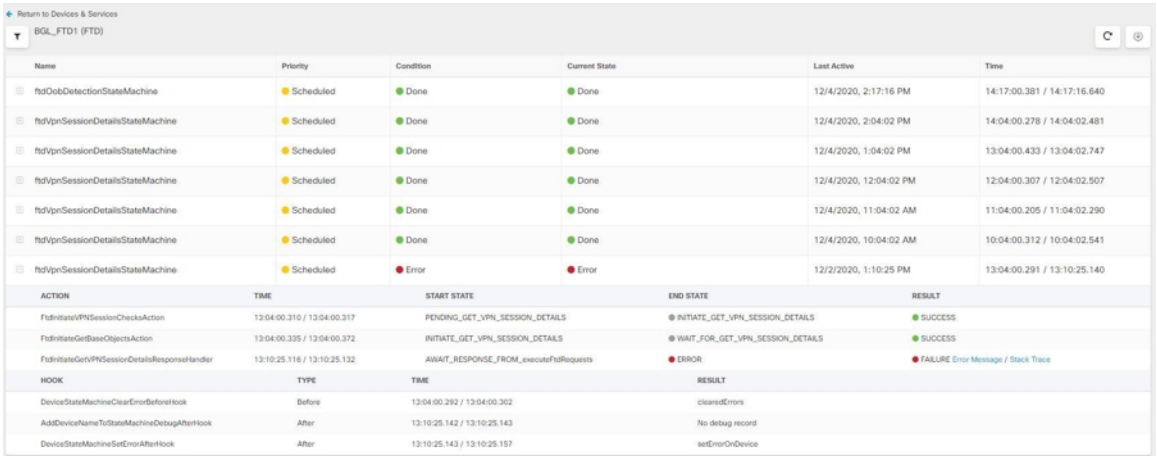
Monitor Workflows in CDO

The **Workflows** page allows you to monitor every process that CDO runs when communicating with devices, Secure Device Connector (SDC), or Secure Event Connector (SEC), and when applying ruleset changes to devices. CDO creates an entry in the workflow table for every step and displays its outcome on this page. The entry contains information pertaining only to the action performed by CDO and not the device it is interacting with.

CDO reports an error when it fails to perform a task on a device. Navigate to the **Workflows** page to see the step where the error occurred, for more details.

This page also helps you determine and troubleshoot errors or share information with TAC, when required.

To navigate to the **Workflows** page, on the **Inventory** page, click the **Devices** tab. Click the appropriate device type tab to locate the device and select the device you want. Under the **Devices and Actions** in the right pane, click **Workflows**. This figure shows the **Workflows** page with entries in the **Workflow** table.



Export Device Workflows

You can download the complete workflow information to a JSON file and provide it when the TAC team asks for further analysis. To export the workflow information, select the corresponding device and, navigate to its **Workflows** page and click the export ( ) icon appearing at the top-right corner.

Copy Stack Trace

If you have an error you cannot resolve and you approach TAC, they may ask you for a copy of the stack trace. To collect the stack trace for the error, click the **Stack Trace** link and click **Copy Stacktrace** to copy the stacks appearing on the screen, to a clipboard.