



# Auditing Device Configurations for Compliance

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Cisco<sup>®</sup> Prime Infrastructure 3.1

Job Aid

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*Auditing Device Configurations for Compliance Job Aid*

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# Basics

## Overview

Prime Infrastructure provides compliance features that you can use to perform audits that determine whether devices have configurations that are not compliant with network requirements.

This information helps you to ensure that the network is running securely and as expected.

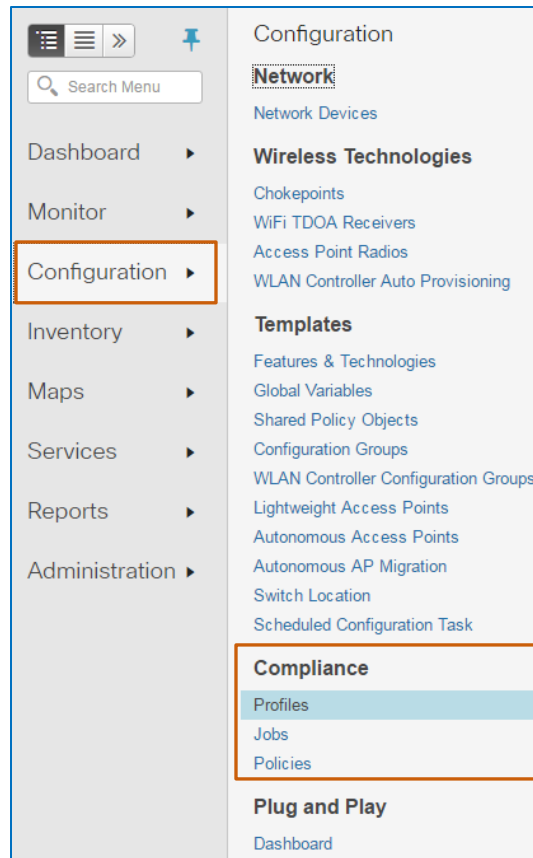


**Note:** To have the compliance functionality available, an administrator needs to enable the compliance service in the system settings, and then log out and back in to Prime Infrastructure.

For more information on enabling compliance functionality, [refer to the FAQ](#).

The compliance functionality that administrators use to configure policies and network operators use to run and evaluate audits is available on the **Configuration** menu, including:

- ❖ Defining custom compliance policies, as needed.
- ❖ Configuring audit profiles and performing audits.
- ❖ Reviewing the audit results, which run as jobs in the system.



## Skills

To perform this task, each role needs to have the following experience.

### Network Administrator (Configuring Policies)

#### Proficient

- ❖ Prime Infrastructure user interface navigation and behaviors
- ❖ Device configuration concepts
- ❖ Writing regular expressions

### Network Operator (Running and Evaluating Audits and Fix Jobs)

#### Basic

- ❖ Prime Infrastructure user interface navigation and behaviors

## Terms

### Compliance Policy

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Defines the procedure that the system uses to evaluate device configurations for compliance to network standards or for configuration expectations

Compliance policies must include one rule and can include as many rules as you need to perform a specific audit.

Each rule that you add must include at least one **Conditions And Actions** statement, which comprise:

- ❖ The condition that defines the expected device configuration, show command output, or device properties criteria for the audit.
- ❖ On auditing the condition criteria, the actions that the system takes when the results of the audit do or do not match.

The system applies the policies that you organize in compliance profiles to audit device configurations. You can define custom compliance policies or select system-defined policies when configuring profiles.

### Compliance Profile

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A method of organizing one or more custom and system compliance policies that the system uses to perform configuration audits

You run audits by using compliance profiles.

### Device Configuration Auditing

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The audit job that you run to determine whether device configurations or outputs meet the requirements that you or other system users have defined in custom compliance policies or by using system-defined policies

### Fix CLI Commands

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**Fix CLI** commands, which can be included in system and custom policies, can correct a configuration when an audit determines that the configuration is out of compliance with the policy that contains the commands.

When an audit job reports violations for a policy that includes **Fix CLI** commands, system users can initiate a fix job to insert those commands in non-compliant device running configurations to correct the issue.

### Fix Job

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The process of distributing **Fix CLI** commands to non-compliant devices in order to correct their configurations and return them to compliant states

## Violation

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An instance in which the device configuration or output does not, or properties do not, meet the policy criteria in the profile

When an audit reports violations, those violations indicate that the associated devices are out of compliance.



# Auditing Device Configurations

## Use Case Scenario

### Roles

As a network administrator, you define the compliance policies that operators can apply to profiles in support of auditing device configurations.

As a network operator, you configure compliance profiles and run audits to determine whether device configurations are compliant or require configuration changes to become compliant. Then, you can make corrections or escalate issues based on your business process.

### Scenario

In this scenario, core routers and switches require the ability to reject unauthorized traffic by referencing Access Control Lists (ACLs). The ACLs vary based on the portions of the network to which they are applied.

The network administrator starts the process by:

- ❖ Configuring the **Security - ACL On Interface** compliance policy, which evaluates all device interfaces that have IP addresses to determine whether each has a defined ACL applied.

When interfaces do not have ACLs applied, the system reports a violation, or state of non-compliance.

The network operator completes the process by:

1. Configuring a security compliance profile that includes:
  - ❖ The custom **Security - ACL On Interface** policy.
  - ❖ The **CDP** policy.  
The Cisco Discovery Protocol is enabled on devices for specialized situations only and can pose a security risk. You include this policy to check whether the protocol is disabled to avoid unnecessary security alerts in the audit results.
  - ❖ The **Host Name** policy.  
Cisco recommends that each device is configured with a unique host name, so that the system and users can recognize each as a distinctly different device. You include this policy to validate host name configuration and to receive an alert in the audit results when a device is lacking a unique host name.
2. In the custom **Security – ACL On Interface** policy, defining the policy parameters based on the network domain that the operator manages, as needed.
3. Running the compliance audit by using the security compliance profile.
4. Evaluating the audit results and identifying violations.
5. Initiating a fix job to correct violations that the custom policy reports.
6. Validating that the fix job is successful.

## Process Overview

**To audit device configurations:**

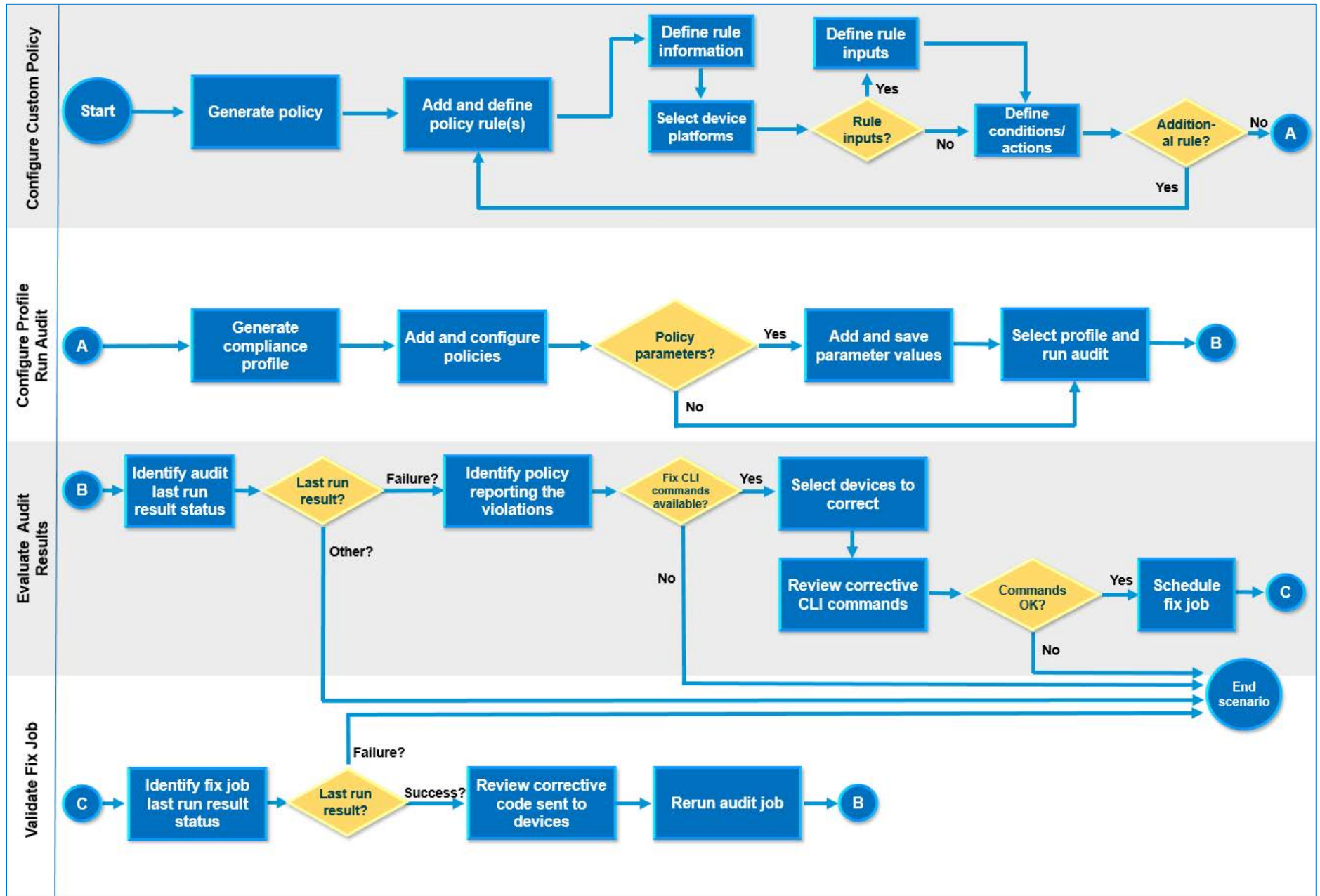
1. Configure a custom compliance policy, as needed, and then define and add policy rules.
2. Configure the compliance profile, including custom and system-provided policies.
3. Run the compliance audit.
4. Evaluate the audit results to determine whether device configurations are compliant with the policy or policies included in the profile.
5. Based on audit results, make corrections, as needed, by running a fix job.
6. After running a fix job, validate that the corrections are successful and the audited devices indicate compliance.

## Process Flow

The process flow illustrates the tasks and determinations that we describe to complete the use case in this job aid. It does not illustrate all of the possible tasks or determinations that you might make when performing audits.



**Tip:** For optimal legibility, set the PDF zoom level to 100%.



## Process Steps

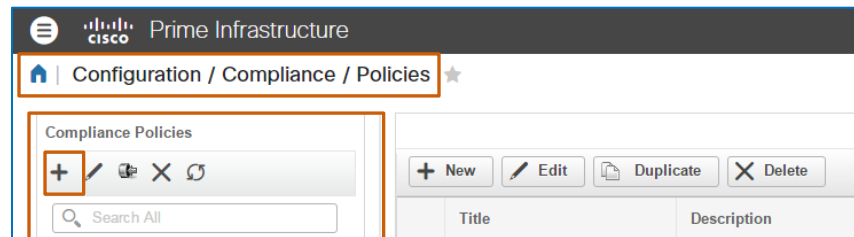
### Task 1: Configure a Custom Compliance Policy

To determine whether core router and switch device interfaces have Access Control Lists in place to recognize and reject unauthorized traffic, you, as the network administrator, configure a custom compliance policy.

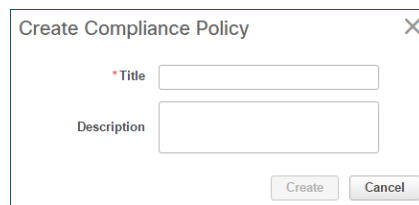
Follow the subtasks and steps below.

#### Subtask 1: Generate the Policy

1. On the **Configuration** menu, navigate to and open the **Compliance | Policies** page.
2. On the **Policies** page, in the **Compliance Policies** list, click **Create Compliance Policy**



The **Create Compliance Policy** dialog box opens.



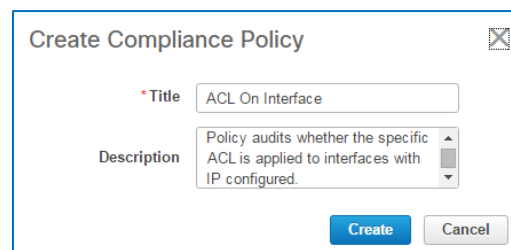
3. In the **Create Compliance Policy** dialog box, in the **Title** field, type a straightforward policy name.



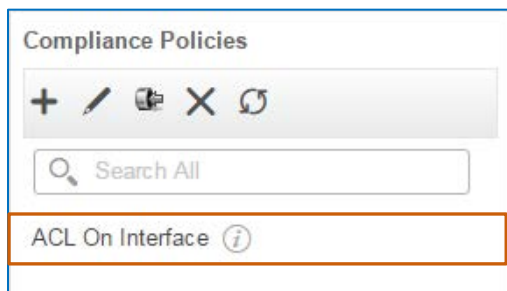
**Note:** The field name requires alphanumeric formatting and can include underscores or symbols.

**Example:** Policy Name\_1(

4. In the **Description** field, type a brief explanation of the use of the policy, and then click **Create**.



The system saves the policy and adds it to the **Compliance Policies** list.



The policy is now available to add rules.



**Important Note:** Compliance policies must include one rule and can include as many rules as you need to perform a specific audit.

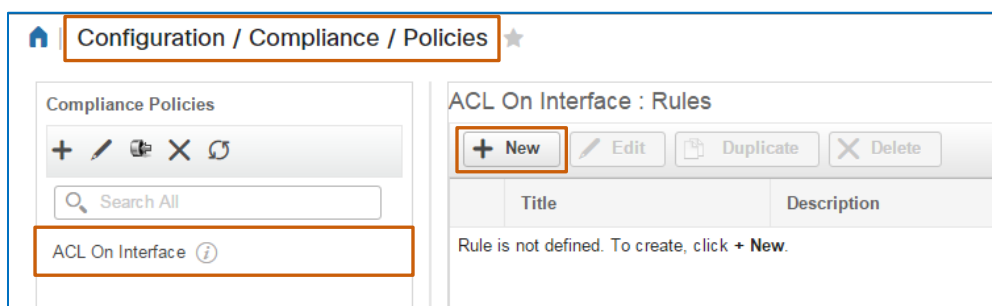
## Subtask 2: Add and Define Policy Rules

With the policy generated, you, as the network administrator, need to add the rule that defines the auditing, reporting, and correction parameters, including:

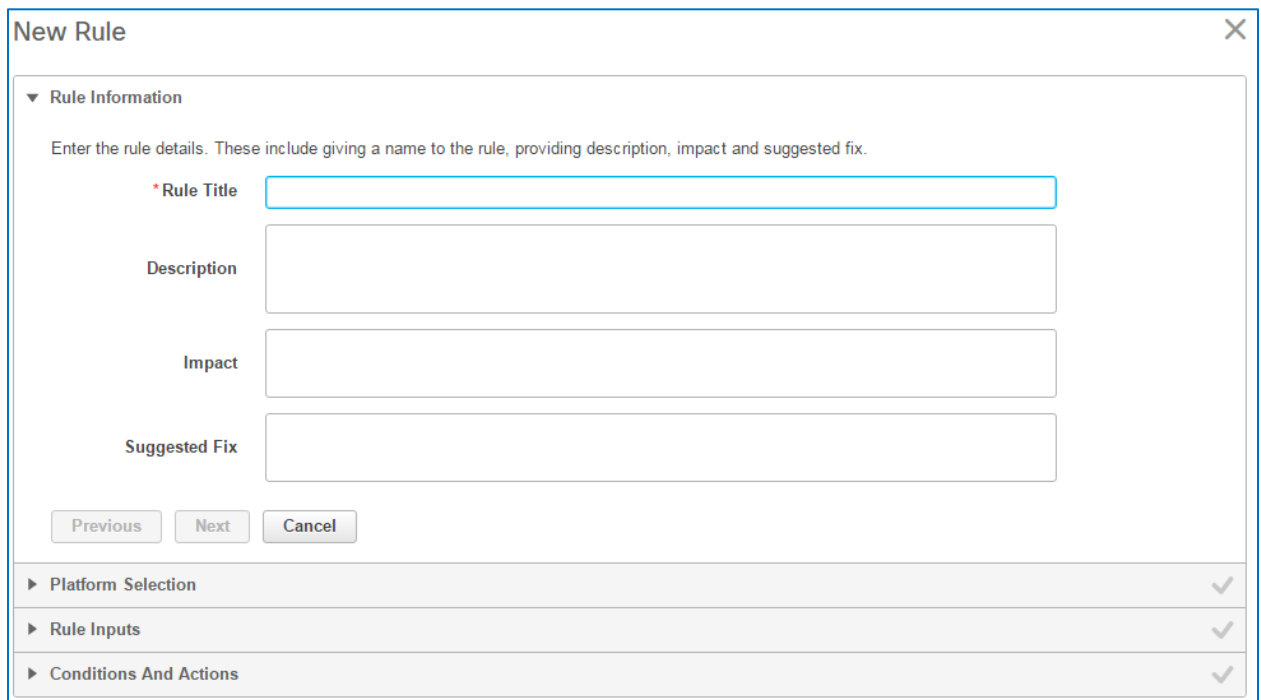
- ❖ Identifying core router and switch device interfaces with IP addresses.
- ❖ Auditing whether their configurations include the ACL, and on those interfaces that do, auditing whether the ACL is configured.
- ❖ Raising violations for configurations in which the ACL is not configured on the interface and providing the CLI code that corrects it.
- ❖ Raising violations for configurations in which the ACL itself is not configured and providing the CLI code that corrects it.

### Follow these steps:

1. In the **Compliance Policies** list, select the policy that you generated.
2. On the toolbar, click **New**.



The system opens the **New Rule** dialog box, which provides a wizard to step you through the process, and displays the **Rule Information** page.



**New Rule**

▼ Rule Information

Enter the rule details. These include giving a name to the rule, providing description, impact and suggested fix.

\*Rule Title

Description

Impact

Suggested Fix

Previous Next Cancel

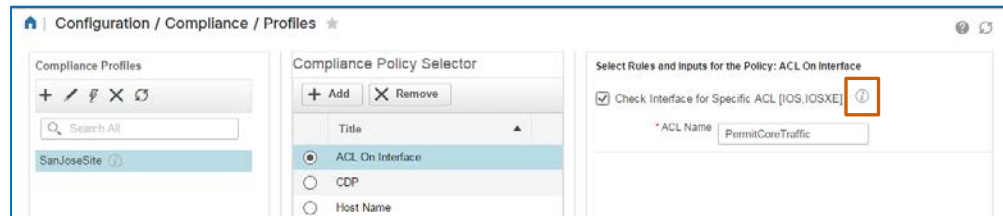
► Platform Selection ✓

► Rule Inputs ✓

► Conditions And Actions ✓



**Note:** When users review the custom policies available for compliance profiles, the rule information appears in the **Rule Information** pop-up window that opens when users point to the information icon.



Configuration / Compliance / Profiles

Compliance Profiles

+ / / X /

Search All

SanJoseSite

Compliance Policy Selector

+ Add X Remove

Title

ACL On Interface

CDP

Host Name

Select Rules and Inputs for the Policy: ACL On Interface

Check Interface for Specific ACL [IOS.IOSXE]

\*ACL Name PermitCoreTraffic



**Tip:** This feature is particularly helpful for system users who can configure profiles in order to run audits, but do not have the rights to access or view a policy's details on the **Policies** page. With this information, they can more easily identify the custom policies that they want to include in a profile.

#### On the Rule Information page:

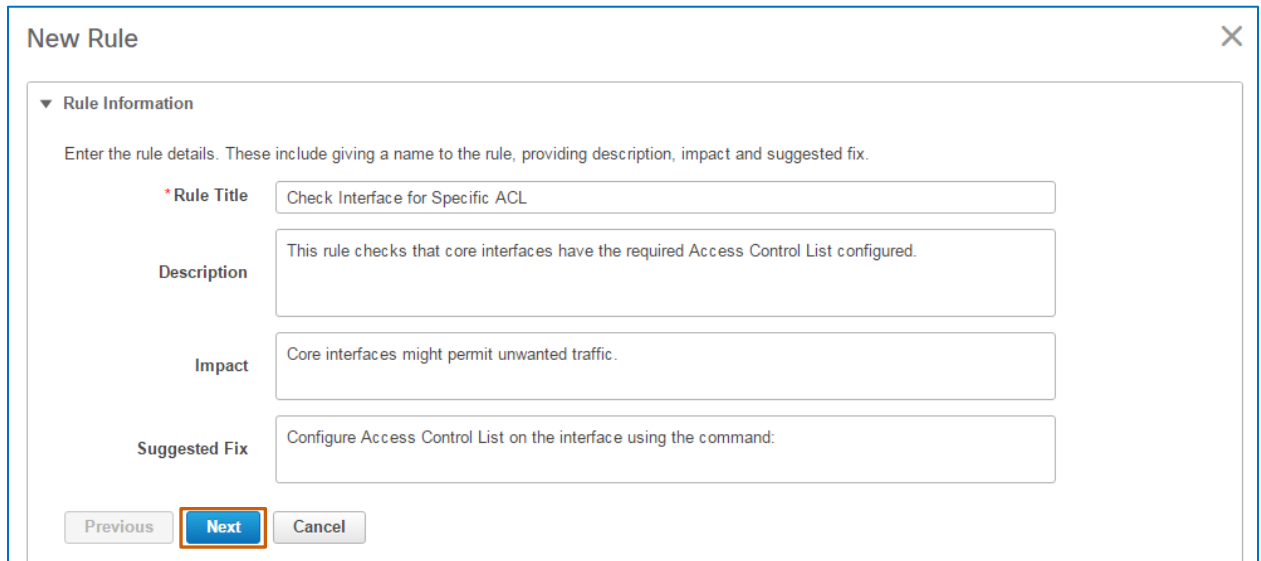
1. In the **Rule Title** field, type a straightforward name for the rule.
2. In the **Description** field, type a brief explanation of the configuration evaluation that the rule performs.
3. To indicate how the network might be affected if the device configuration or output does not meet the rule or rules in the policy, type it in the **Impact** field.
4. To recommend how to correct the issue so that the device returns to a state of compliance, type it in the **Suggested Fix** field.



**Tip:** The rule that you are adding can contain CLI commands that correct the problem, referred to as fixes.

In these cases, when you are recommending corrections in the **Suggested Fix** field, you can also describe the corrective CLI commands contained in the rule, which can help system users determine whether to take the corrective action.

- To continue, click **Next**.



**New Rule**

▼ Rule Information

Enter the rule details. These include giving a name to the rule, providing description, impact and suggested fix.

\* Rule Title: Check Interface for Specific ACL

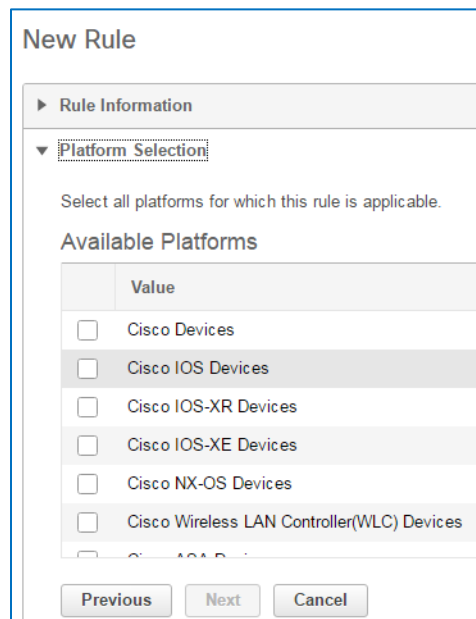
Description: This rule checks that core interfaces have the required Access Control List configured.

Impact: Core interfaces might permit unwanted traffic.

Suggested Fix: Configure Access Control List on the interface using the command:

Previous **Next** Cancel

The wizard opens the **Platform Selection** page.



**New Rule**

► Rule Information

▼ Platform Selection

Select all platforms for which this rule is applicable.

Available Platforms

	Value
<input type="checkbox"/>	Cisco Devices
<input type="checkbox"/>	Cisco IOS Devices
<input type="checkbox"/>	Cisco IOS-XR Devices
<input type="checkbox"/>	Cisco IOS-XE Devices
<input type="checkbox"/>	Cisco NX-OS Devices
<input type="checkbox"/>	Cisco Wireless LAN Controller(WLC) Devices

Previous **Next** Cancel

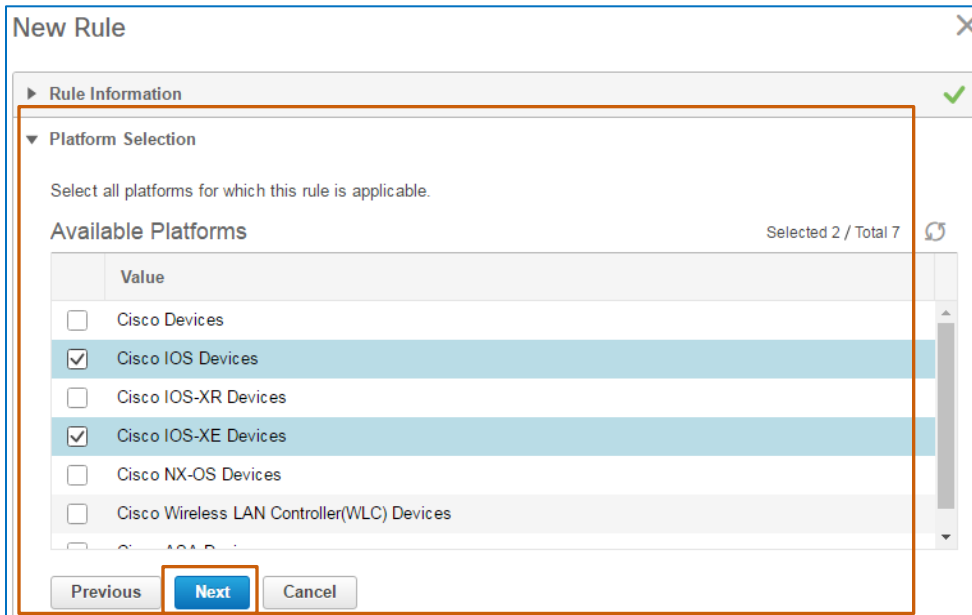
**On the Platform Selection page:**

- ❖ In the **Available Platforms** list, select each platform that you want the rule to audit, and then click **Next**.



**Important Note:** During auditing, the system applies the rules to and audits those devices that match the platforms that you select here, regardless of the types of devices that you select for an audit when configuring a profile.

For more information, [refer to the FAQ](#).



**New Rule**

Rule Information

Platform Selection

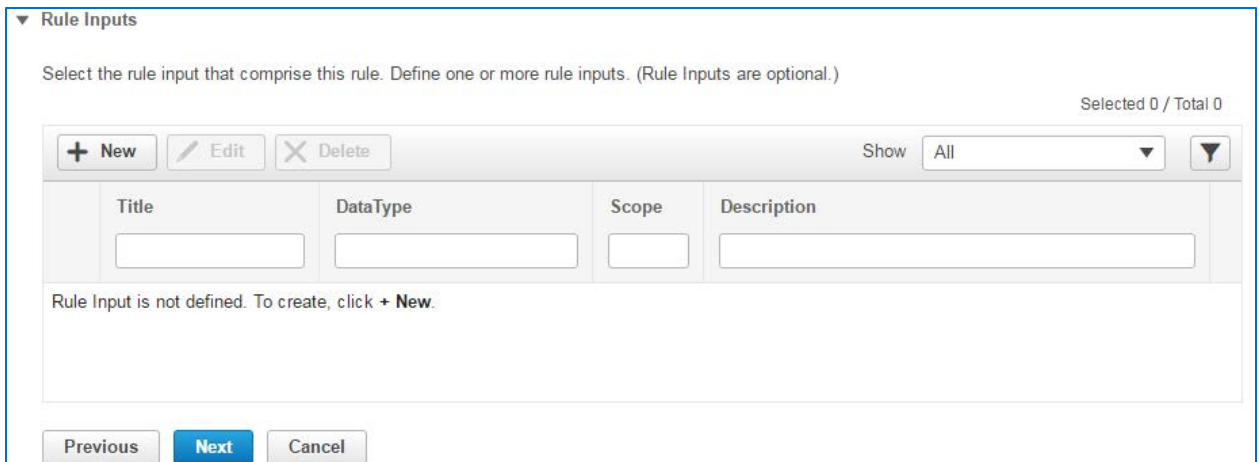
Select all platforms for which this rule is applicable.

Available Platforms Selected 2 / Total 7

Value
<input type="checkbox"/> Cisco Devices
<input checked="" type="checkbox"/> Cisco IOS Devices
<input type="checkbox"/> Cisco IOS-XR Devices
<input checked="" type="checkbox"/> Cisco IOS-XE Devices
<input type="checkbox"/> Cisco NX-OS Devices
<input type="checkbox"/> Cisco Wireless LAN Controller(WLC) Devices

Previous **Next** Cancel

The wizard opens the **Rule Inputs** page.



Rule Inputs

Select the rule input that comprise this rule. Define one or more rule inputs. (Rule Inputs are optional.)

Selected 0 / Total 0

+ New Edit Delete

Show All

Title	DataType	Scope	Description

Rule Input is not defined. To create, click + New.

Previous **Next** Cancel



**On the Rule Inputs page, follow these steps:**

In this scenario, you are adding a rule that provides the parameter that defines the Access Control List name that the audit needs to find in the configuration.

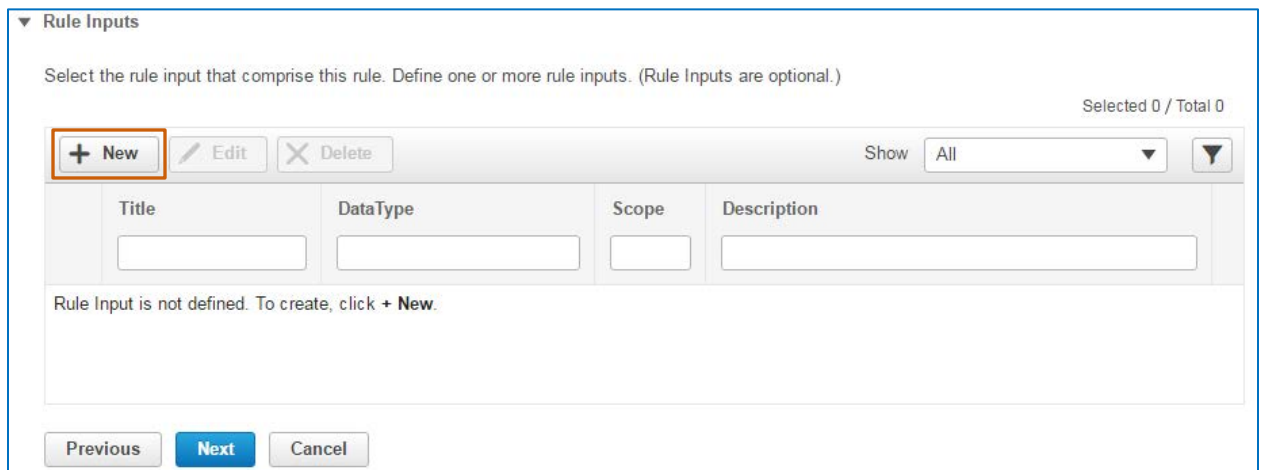


**Important Note:** Rule inputs are optional.

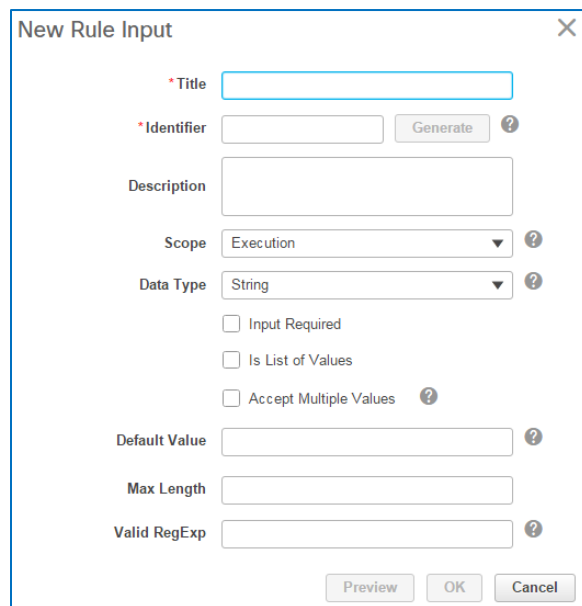
When you do add rule inputs at this point, a user has the option to define values for the rule inputs when organizing the policies in profiles.

If you do not include rule inputs here, the option to define values in the profile is not available.

1. On the toolbar, click **New**.



The **New Rule Input** dialog box opens.



2. In the **Title** field, type a straightforward rule name that communicates its use.

3. To add a rule input identifier, beside the **Identifier** field, click **Generate**. The system populates the **Identifier** field with a unique, correctly formatted identifier.



**Note:** System users can include the **Rule Input Identifier** when, in condition and action statements, they write regular expressions to define condition or action criteria or they write the **Fix CLI** commands that can correct a configuration when it violates the policy rule.

4. To describe the rule input configuration, type a brief explanation in the **Description** field.
5. To indicate how the system will apply the rule input, select it in the **Scope** drop-down list.



**Tip:** Selecting an **Execution** scope configures the system to apply the parameters to the conditions and in the **Fix CLI** commands.

Selecting a **Fix** scope configures the system to apply the parameters in fix jobs only, and is not inclusive of the execution scope.

6. To indicate the type of data to which the rule applies, which controls the input syntax, select it in the **Data Type** drop-down list.
7. To require the user to provide a value for the rule input, select the **Input Required** check box.

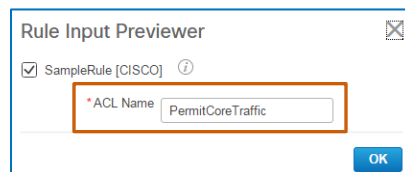


**Note:** When a value is required, the user can accept the default value that you add in step 8 or change it, as needed, when configuring the profile.

8. To provide the parameter that the system will look for in the configuration by default, type it in the **Default Value** drop-down list.
9. To see how the rule will appear in the compliance profile, click **Preview**.

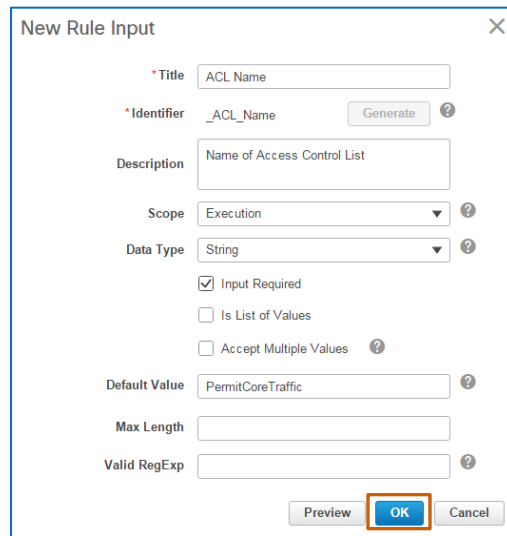
The **Rule Input Previewer** dialog box opens and displays the rule, which is available for editing, if changes are necessary.

When you make changes to the rule input here, the system applies the change to the rule.



10. To continue, click **OK**. The dialog box closes.

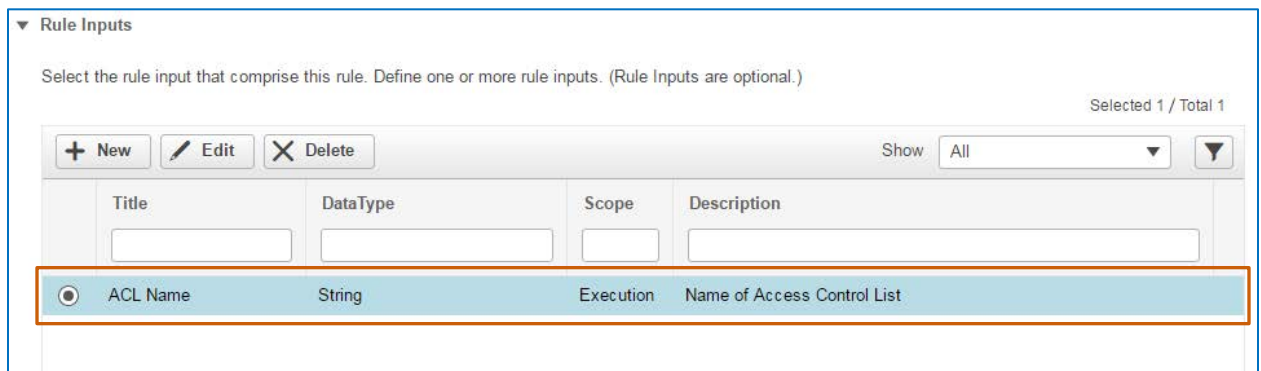
11. In the **New Rule Input** dialog box, to continue, click **OK**.



The 'New Rule Input' dialog box contains the following fields and controls:

- Title:** Text input field with 'ACL Name' entered.
- Identifier:** Text input field with '\_ACL\_Name' entered, a 'Generate' button, and a help icon.
- Description:** Text input field with 'Name of Access Control List' entered.
- Scope:** Dropdown menu with 'Execution' selected and a help icon.
- Data Type:** Dropdown menu with 'String' selected and a help icon.
- Input Required:** Checked checkbox.
- Is List of Values:** Unchecked checkbox.
- Accept Multiple Values:** Unchecked checkbox and a help icon.
- Default Value:** Text input field with 'PermitCoreTraffic' entered and a help icon.
- Max Length:** Text input field.
- Valid RegExp:** Text input field and a help icon.
- Buttons:** 'Preview', 'OK' (highlighted with a red box), and 'Cancel'.

The **New Rule Input** dialog box closes and the **Rule Inputs** page lists the rule that you defined.



The 'Rule Inputs' page displays a table of defined rule inputs. The table has the following structure:

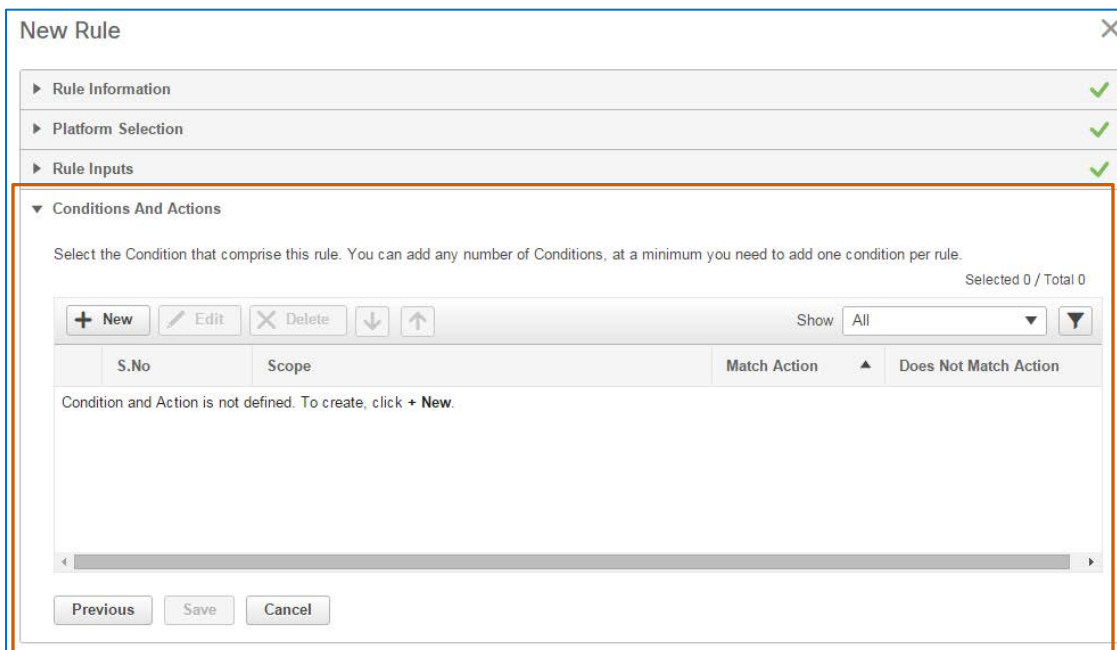
	Title	DataType	Scope	Description
<input checked="" type="radio"/>	ACL Name	String	Execution	Name of Access Control List

Additional UI elements include:

- Buttons: '+ New', 'Edit' (pencil icon), 'Delete' (X icon).
- Filter: 'Show All' dropdown and a filter icon.
- Status: 'Selected 1 / Total 1'.

12. With the rule input defined, click **Next**.

The wizard opens the **Conditions And Actions** page.



**On the Conditions And Actions page, follow these steps:**

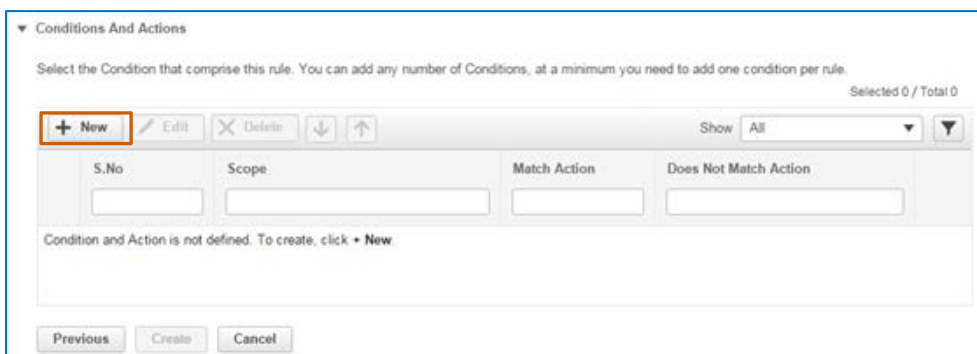
In this scenario, we are adding four condition and action statements so that while auditing each configuration, the system:

- ❖ Parses each device's running configuration into interface blocks.
- ❖ In each configuration block generated by the previous condition, determines whether the block has an IP address.
- ❖ In each block with an IP address, determines whether the configuration includes the access group name or number that you added as the default value in the rule input, and that if it does not, the system reports a violation.
- ❖ In each running configuration that includes the correct Access Control List, determines whether the Access Control List is configured in each device's running configuration and that, if it is not, the system reports a violation.

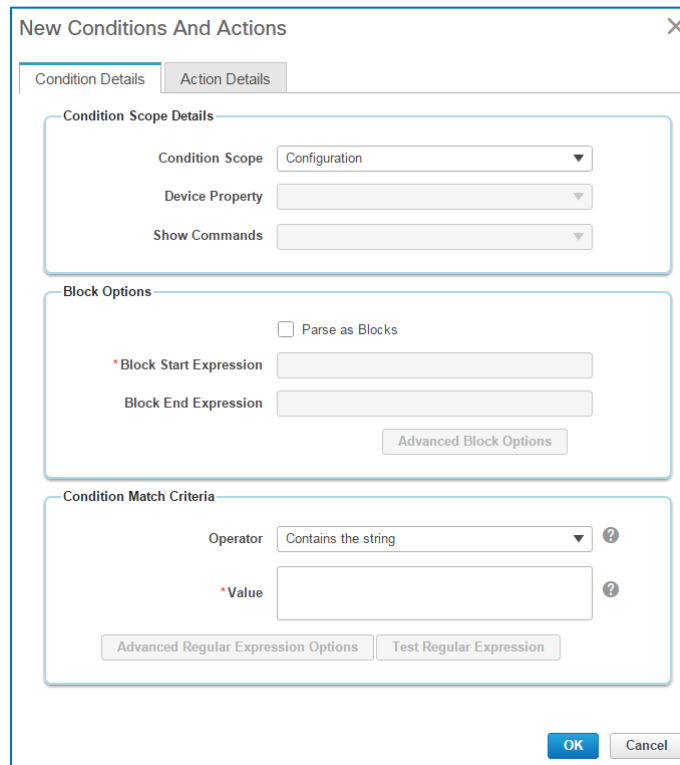


**Note:** You must add a minimum of one condition and action statement to a rule.

1. On the toolbar, click **New**.



The **New Conditions And Actions** dialog box opens.



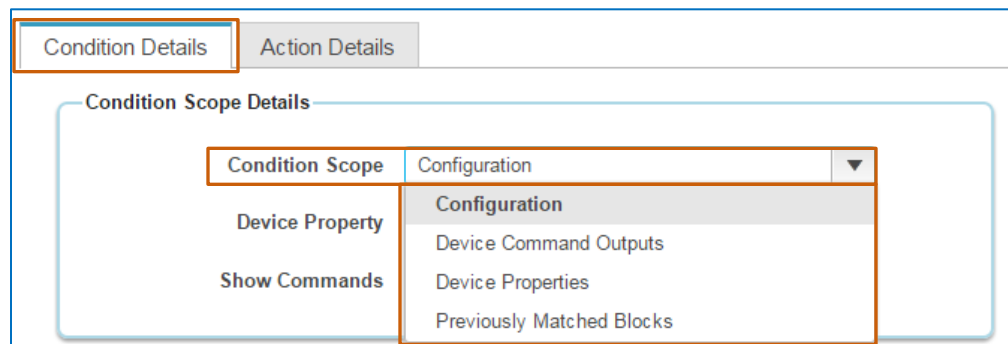
The dialog box titled "New Conditions And Actions" has two tabs: "Condition Details" and "Action Details". The "Condition Details" tab is active. It contains three sections:

- Condition Scope Details:** Includes three dropdown menus: "Condition Scope" (set to "Configuration"), "Device Property", and "Show Commands".
- Block Options:** Includes a checkbox "Parse as Blocks", a text field "Block Start Expression", a text field "Block End Expression", and a button "Advanced Block Options".
- Condition Match Criteria:** Includes a dropdown menu "Operator" (set to "Contains the string"), a text field "Value", and two buttons: "Advanced Regular Expression Options" and "Test Regular Expression".

At the bottom right are "OK" and "Cancel" buttons.

To indicate the scope, method, and conditions that comprise the audit criteria:

- On the **Condition Details** tab, in the **Condition Scope Details** section, select the option that defines the aspect of the device to which you are applying the condition in the **Condition Scope** drop-down list.

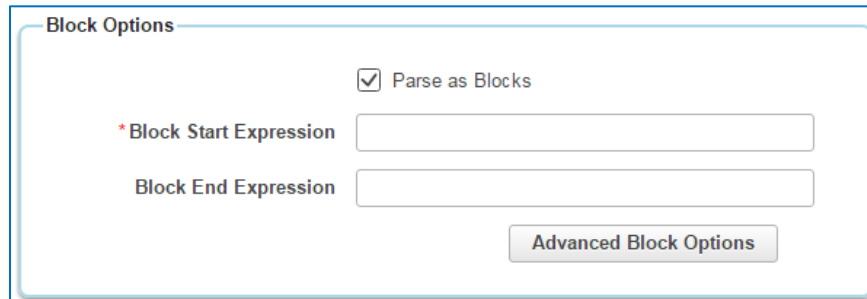


The dialog box is shown with the "Condition Details" tab selected. The "Condition Scope" dropdown menu is open, showing the following options:

- Configuration
- Device Command Outputs
- Device Properties
- Previously Matched Blocks

The "Condition Scope" dropdown is highlighted with an orange border, and the list of options is also highlighted with an orange border.

- To indicate that you want the system to parse the configuration into interface blocks, in the **Block Options** section, select the **Parse as Blocks** check box.



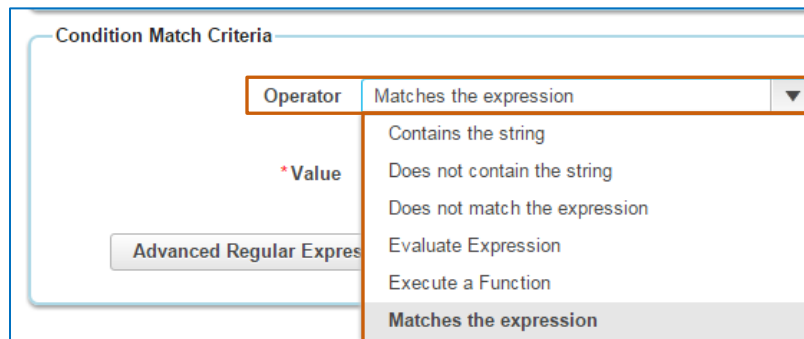
The 'Block Options' form contains a checked checkbox labeled 'Parse as Blocks'. Below it are two text input fields: '\*Block Start Expression' and 'Block End Expression'. At the bottom right is a button labeled 'Advanced Block Options'.

- To define the regular expression that indicates the start of the block, type it in the **Block Start Expression** field.



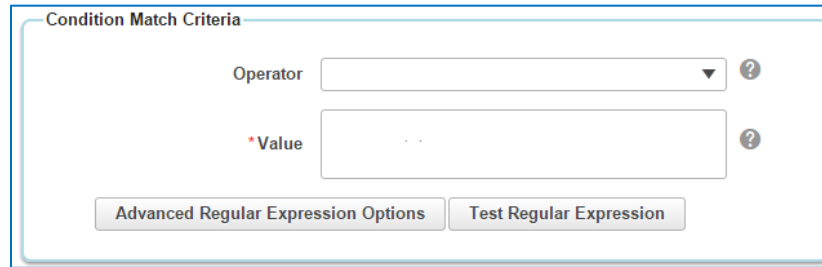
**Tip:** Defining a block end expression is optional when running configurations contain indentation changes that prompt the system to recognize the block's end point.

- To define the operator that the condition uses for comparison, in the **Condition Match Criteria** section, select it in the **Operator** drop-down list.



The 'Condition Match Criteria' form shows a dropdown menu for the 'Operator' field. The dropdown is open, displaying several options: 'Matches the expression' (selected), 'Contains the string', 'Does not contain the string', 'Does not match the expression', 'Evaluate Expression', 'Execute a Function', and 'Matches the expression' (highlighted at the bottom). To the left of the dropdown is a text input field labeled '\*Value'. Below the input field is a button labeled 'Advanced Regular Expressions'.

6. To define the parameter that the condition uses for comparison, type it in the **Value** field.



Condition Match Criteria

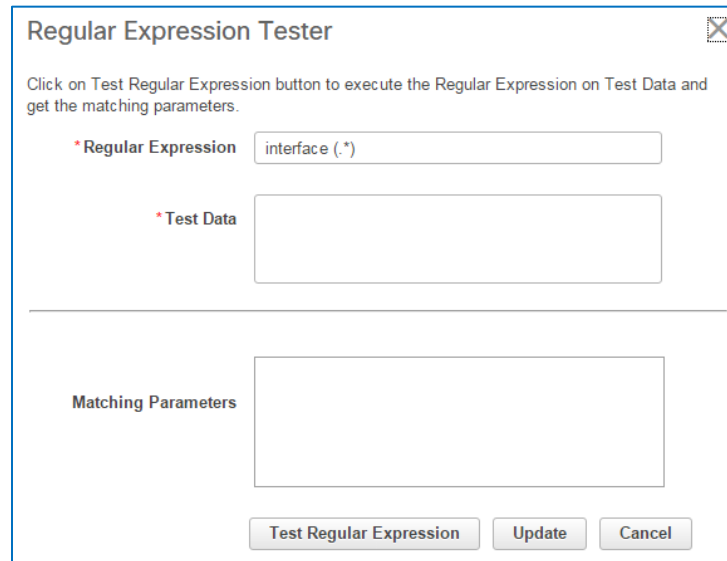
Operator  ?

\*Value  ?

Advanced Regular Expression Options Test Regular Expression



**Note:** To determine whether the condition match criteria generate a valid regular expression, you can click **Test Regular Expression** to open the **Regular Expression Tester** dialog box and verify the expression.



Regular Expression Tester

Click on Test Regular Expression button to execute the Regular Expression on Test Data and get the matching parameters.

\*Regular Expression

\*Test Data

Matching Parameters

Test Regular Expression Update Cancel

The following screenshot illustrates the completed **Condition Details** tab for the statement that identifies and extracts the device interface names.

New Conditions And Actions

Condition Details

Action Details

Condition Scope Details

Condition Scope

Configuration

Device Property

Show Commands

Block Options

☒ Parse as Blocks

\*Block Start Expression

^interface .\*

Block End Expression

Advanced Block Options

Condition Match Criteria

Operator

Matches the expression

?

\*Value

interface (.\*)

?

Advanced Regular Expression Options

Test Regular Expression

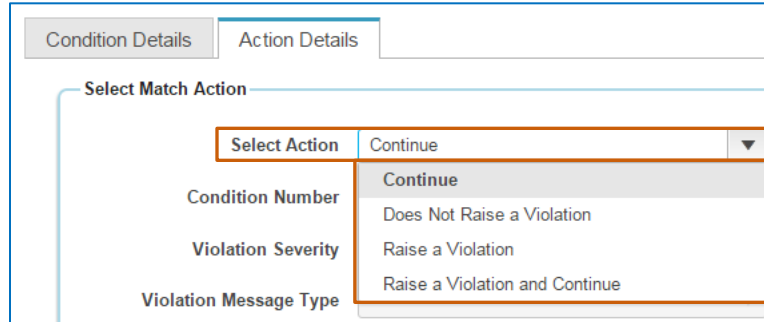
OK

Cancel



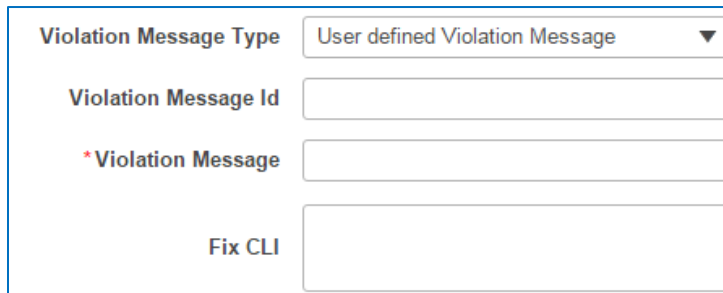
To indicate the actions that the system takes when the test results indicate that a configuration matches or does not match the test criteria:

7. On the **Action Details** tab, in the **Select Match Action** section, indicate the action that you want the system to take based on the results of testing the condition in the **Select Action** drop-down list.



- ❖ If you select **Continue**, the system does not raise a violation and continues to the next condition. Go to step 8.
- ❖ If you select **Does Not Raise a Violation**, the **Condition Number** field becomes unavailable. Continue to step 8.
- ❖ If you select **Raise a Violation**:
  - a. In the **Violation Severity** drop-down list, select the severity level that the system applies to the violation.
  - b. To type a custom violation message that users will see, select **User defined Violation Message** in the **Violation Message Type** field.

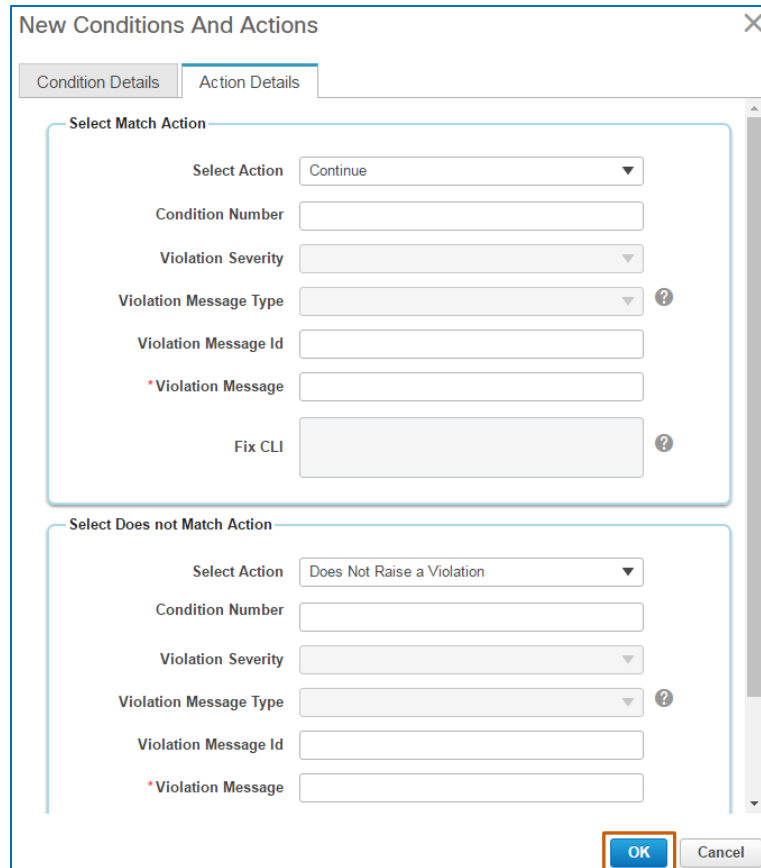
The **Violation Message Id**, **Violation Message**, and **Fix CLI** fields become available.



- i. Optionally, to support business processes, in the **Violation Message Id** field, type freeform text to indicate a violation identifier.
  - ii. In the **Violation Message** field, type the message text as it will appear to system users.
  - iii. To indicate the CLI commands that the system will apply to correct the problem, type them in the **Fix CLI** field, and then go to step 9.
- ❖ If you select **Raise a Violation and Continue**, the system raises a violation and continues to the next condition. Follow the steps to **Raise a Violation**, and then go to step 8.
8. In the **Select Does not Match Action** section, repeat step 7, and then go to step 9.

The following screenshot illustrates the completed **Action Details** tab. When the system identifies the device interface, it can continue.

When the audit does not find an interface, it can continue without raising a violation.



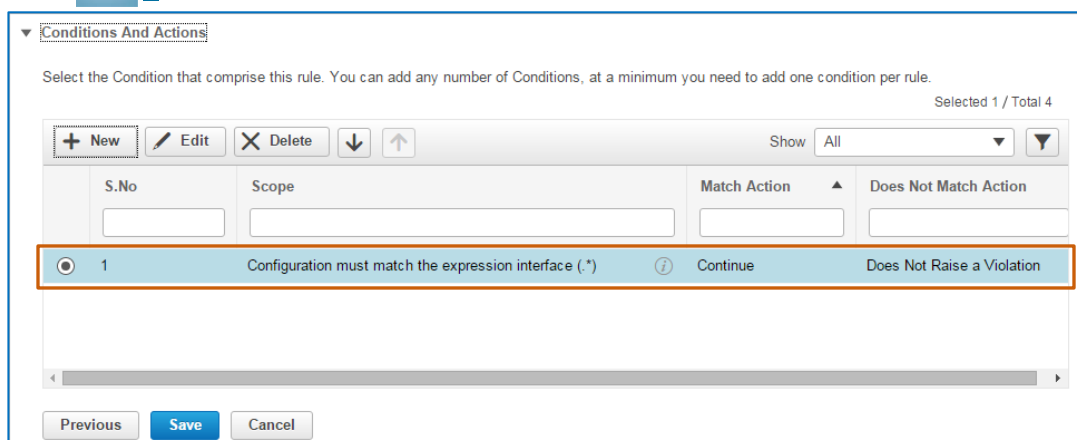
The screenshot shows the 'New Conditions And Actions' dialog box with the 'Action Details' tab selected. It contains two sections: 'Select Match Action' and 'Select Does not Match Action'. Both sections have fields for 'Select Action', 'Condition Number', 'Violation Severity', 'Violation Message Type', 'Violation Message Id', '\*Violation Message', and 'Fix CLI'. The 'Select Match Action' section has 'Continue' selected, and the 'Select Does not Match Action' section has 'Does Not Raise a Violation' selected. The 'OK' button is highlighted with a red box.

9. To continue, click **OK**.

The dialog box closes. The system validates the statement logic and adds it in the **Conditions And Actions** list.



**Note:** When the statement contains invalid logic, the system opens a message to alert you of the issue.



The screenshot shows the 'Conditions And Actions' list. It has a table with columns: S.No, Scope, Match Action, and Does Not Match Action. The first row is selected and highlighted with a red box. The table contains the following data:

S.No	Scope	Match Action	Does Not Match Action
1	Configuration must match the expression interface (*)	Continue	Does Not Raise a Violation

The 'OK' button is highlighted with a red box.

10. To add the condition and action statement that determines whether the extracted interfaces have IP addresses, return to step 1 and follow the steps to define the next statement, and then go to step 11.

The following screenshots illustrate the completed **Condition Details** and **Action Details** tabs.

The condition verifies that the extracted interfaces have IP addresses.



**New Conditions And Actions**

Condition Details | Action Details

**Condition Scope Details**

Condition Scope: Previously Matched Blocks

Device Property:

Show Commands:

**Block Options**

☐ Parse as Blocks

\* Block Start Expression:

Block End Expression:

Advanced Block Options

**Condition Match Criteria**

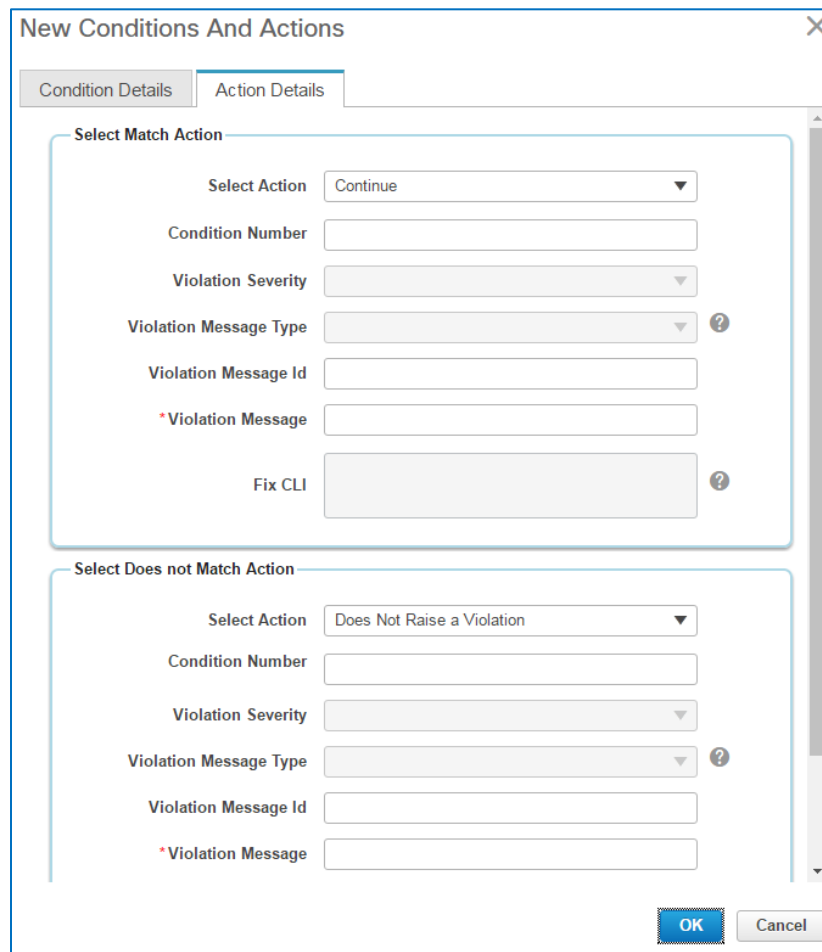
Operator: Matches the expression

\* Value: ip address (id+ .id+ .id+ .id+ ) . \*

Advanced Regular Expression Options | Test Regular Expression

OK | Cancel

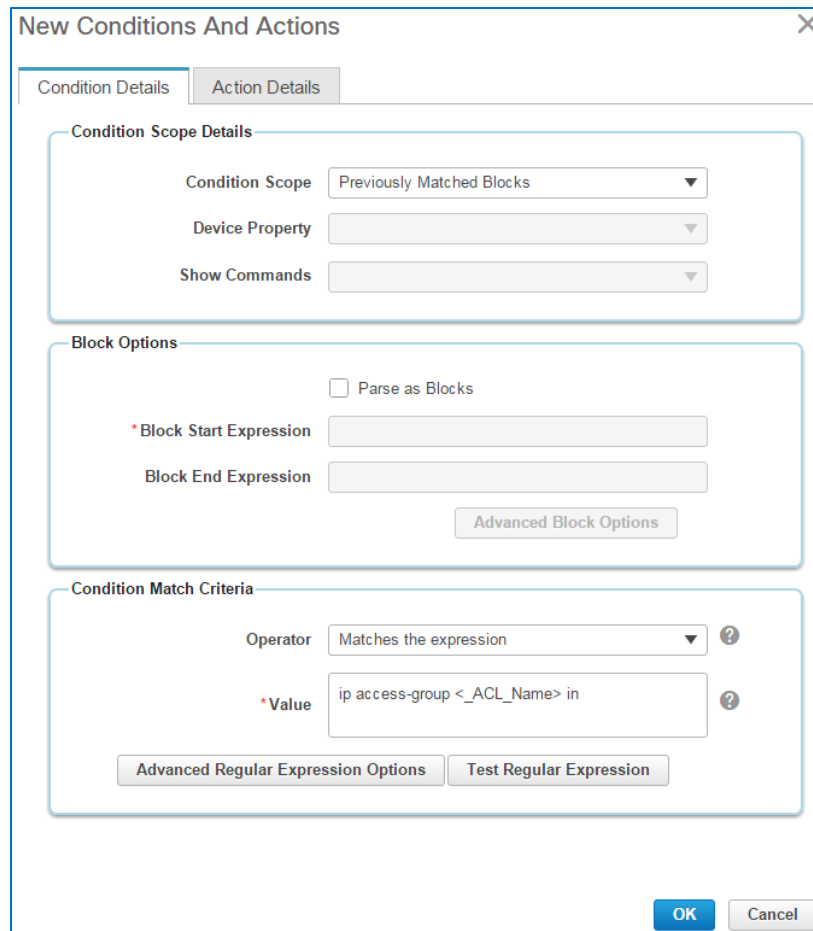
When the interface has an IP address, the system can continue the process. When the interface does not have an IP address, the condition does not raise a violation.



11. To add the condition and action statement that determines whether each configuration block includes the Access Control List name that you added as the default value for the rule input, return to step 1 and follow the steps to define the next statement, and then go to step 12.

The following screenshots illustrate the completed **Condition Details** and **Action Details** tabs.

The condition evaluates each parsed block to determine if it contains the **PermitCoreTraffic** access group name, which is the default value that you typed in the rule input entry.



**New Conditions And Actions**

Condition Details | Action Details

**Condition Scope Details**

Condition Scope: Previously Matched Blocks

Device Property:

Show Commands:

**Block Options**

☐ Parse as Blocks

\*Block Start Expression:

Block End Expression:

Advanced Block Options

**Condition Match Criteria**

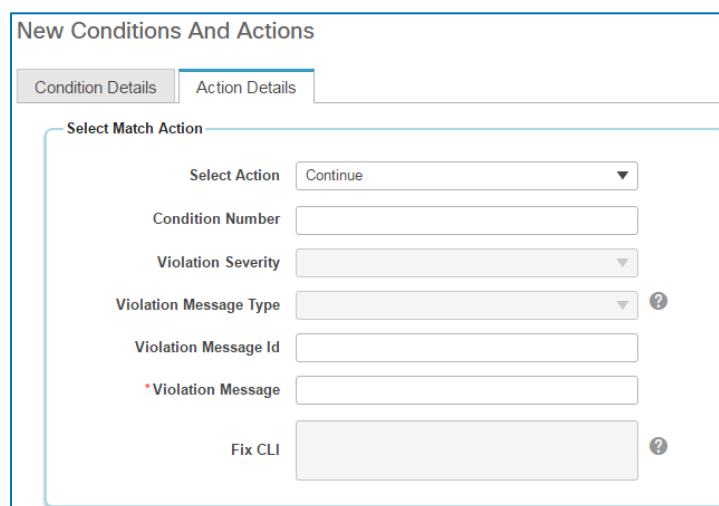
Operator: Matches the expression

\*Value: ip access-group <\_ACL\_Name> in

Advanced Regular Expression Options | Test Regular Expression

OK | Cancel

When the system determines that the block has the access group name with the name that matches **PermitCoreTraffic**, the system can continue the process.



**New Conditions And Actions**

Condition Details | Action Details

**Select Match Action**

Select Action: Continue

Condition Number:

Violation Severity:

Violation Message Type:

Violation Message Id:

\*Violation Message:

Fix CLI:

When the system determines that the **PermitCoreTraffic** access group name is not in the interface block, the system reports a critical violation for that interface due to the significant security risk and includes a custom description of the issue.

In this case, you are including the **Fix CLI** commands that can configure the access group name on the interface. When the operator evaluates the results of the audit job and sees this violation, he or she can determine whether to send the **Fix CLI** commands to the non-compliant running configuration by using a fix job in an effort to correct the problem.



**Important Note:** In this scenario, we are illustrating the use of grep in the **Violation Message** text and the **Fix CLI** commands to replace the variable **<1.1>** with actual values, which, in this case, are the interface names.

For more information on using grep, [refer to the FAQ](#).

Select Does not Match Action

Select Action

Raise a Violation and Continue

Condition Number

Violation Severity

Critical

Violation Message Type

User defined Violation Message

Violation Message Id

\* Violation Message

Interface <1.1> does not have ACL: <\_ACL\_Name>

Fix CLI

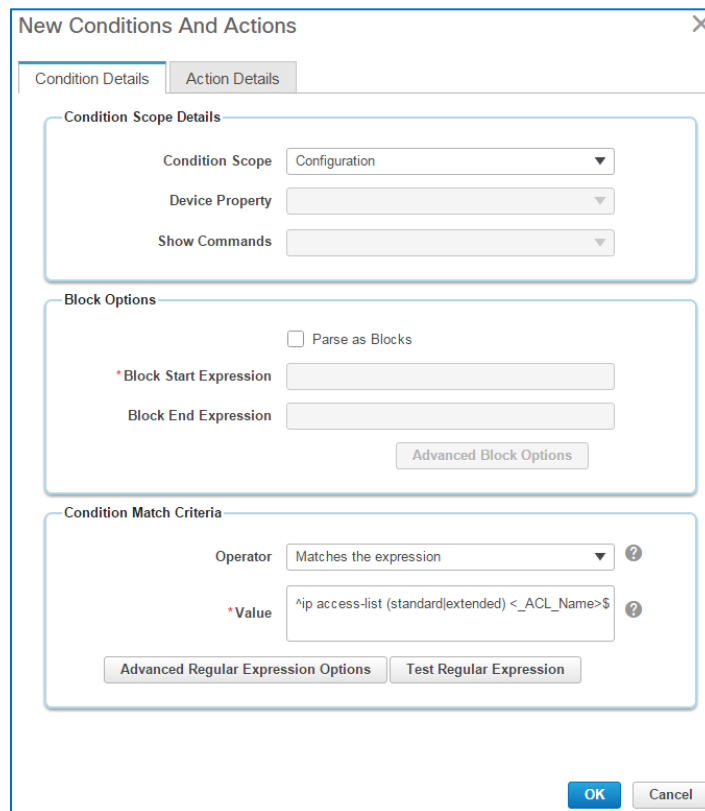
interface <1.1>

ip access-group <\_ACL\_Name> in

- To add the condition and action statement that determines whether the Access Control List itself is configured in each device's running configuration, return to step 1 and follow the steps to define the next statement, and then, go to step 13.

The following screenshots illustrate the completed **Condition Details** and **Action Details** tabs.

The condition verifies that the **PermitCoreTraffic** Access Control List itself is configured in each device's running configuration.



**New Conditions And Actions**

Condition Details | Action Details

**Condition Scope Details**

Condition Scope: Configuration

Device Property:

Show Commands:

**Block Options**

☐ Parse as Blocks

\*Block Start Expression:

Block End Expression:

Advanced Block Options

**Condition Match Criteria**

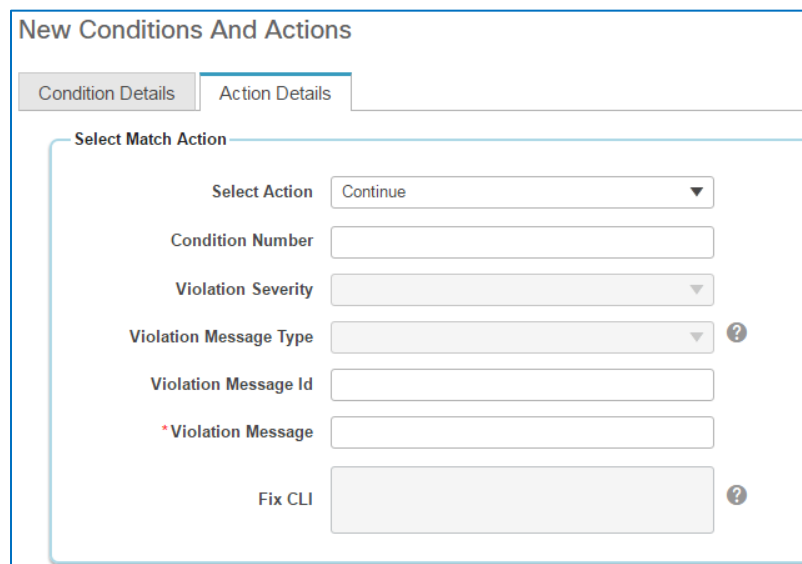
Operator: Matches the expression

\*Value: ^ip access-list (standard|extended) <\_ACL\_Name>\$

Advanced Regular Expression Options | Test Regular Expression

OK | Cancel

When the system determines that the running configuration contains the **PermitCoreTraffic** Access Control List, the system can continue the process.



**New Conditions And Actions**

Condition Details | Action Details

**Select Match Action**

Select Action: Continue

Condition Number:

Violation Severity:

Violation Message Type:

Violation Message Id:

\*Violation Message:

Fix CLI:

When the system determines that the configuration includes the **PermitCoreTraffic** Access Control List, but the list is not configured, the system reports a major violation for that interface because it continues to pose a security risk, and includes a custom description of the issue.

In this case, you are including the **Fix CLI** commands that can configure the Access Control List itself. When the operator evaluates the results of the audit job and sees this violation, he or she can determine whether to send the **Fix CLI** commands to the non-compliant running configuration by using a fix job in an effort to correct the problem.

Select Does not Match Action

Select Action

Raise a Violation

Condition Number

Violation Severity

Major

Violation Message Type

User defined Violation Message

Violation Message Id

\*Violation Message

ACL: <\_ACL\_Name> is not Configured on Device

Fix CLI

ip access-list extended <\_ACL\_Name>  
permit igmp any any

When you click **OK**, the system closes the **New Rule** dialog box and the **Conditions And Actions** page lists the statements that you added.

Conditions And Actions

Select the Condition that comprise this rule. You can add any number of Conditions, at a minimum you need to add one condition per rule.

Selected 1 / Total 4

+ New

Edit

Delete

↓

↑

Show

All

	Scope	Match Acti...	Does Not Match Action
<input checked="" type="radio"/>	1 Configuration must match the expression interface (.*)	Continue	Does not Raise a Violation
<input type="radio"/>	2 Selected Configuration block must match the expression ip address (ld+.ld+....)	Continue	Does not Raise a Violation
<input type="radio"/>	3 Selected Configuration block must match the expression ip access-group <_...	Continue	Raise a Violation and Con...
<input type="radio"/>	4 Configuration must match the expression ^ip access-list (standard extended) ...	Continue	Raise a Violation

Previous

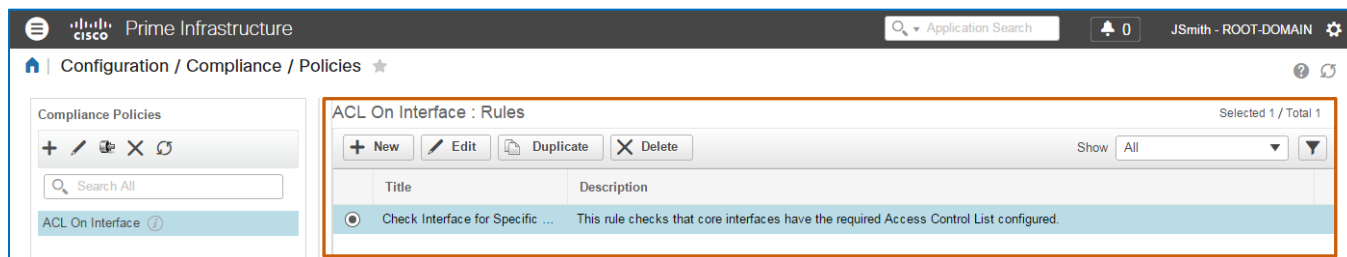
Save

Cancel

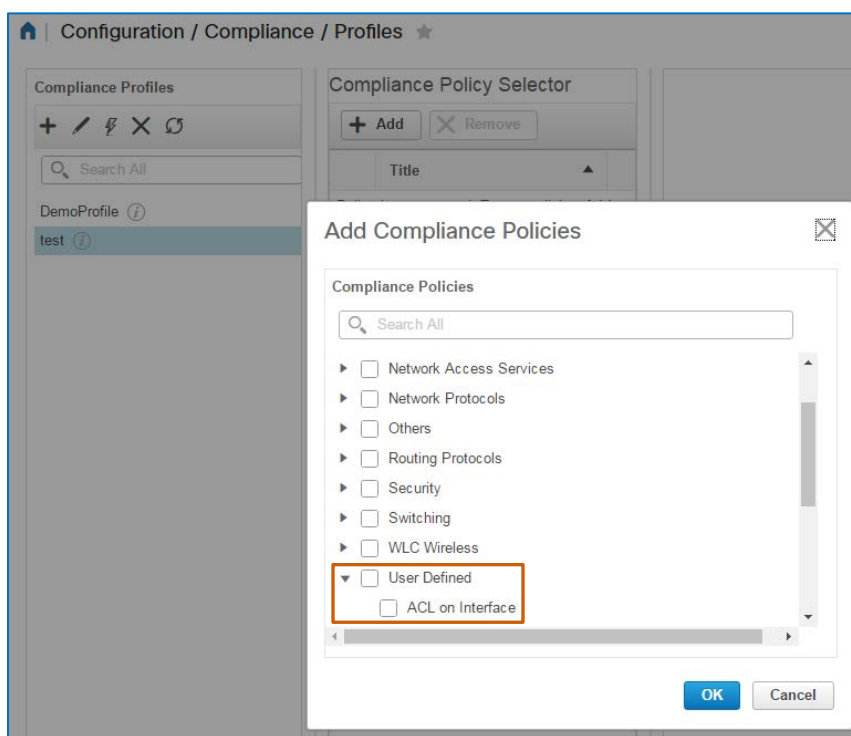
13. To save the rule that you added, click **Save**.



The system lists the rule for the **ACL On Interface** policy.



When you add the policy and associated rules, it is available for inclusion in profiles. You access custom policies in the **User Defined** category when adding policies to a profile.



## Task 2: Configure the Compliance Profile

You, as the network operator, need to perform a security audit on network interfaces. You want to configure a profile that performs the security validation that you need in a single audit job.

To do so, you configure a profile that includes:

- ❖ The custom **ACL On Interface** policy, which audits whether device interface configurations include a specific Access Control List and that the list is configured on the interface.
- ❖ The system-provided **CDP** policy, which audits whether the Cisco Discovery Protocol is disabled on the device, and if enabled, reports a violation.
- ❖ The system-provided **Host Name** policy, which audits whether each device has a host name, and if not, reports a violation.

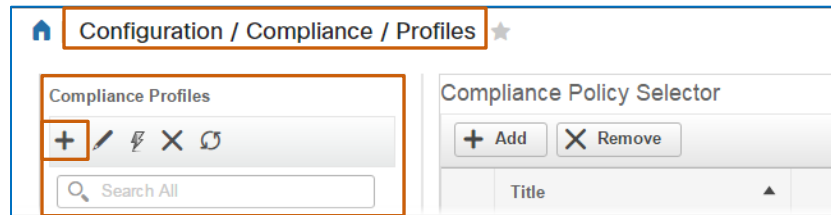
Follow the subtasks and steps below.

### Subtask 1: Generate the Profile

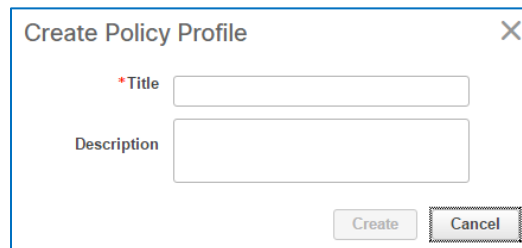
1. On the **Configuration** menu, navigate to and open the **Compliance | Profiles** page.



2. On the **Profiles** page, in the **Compliance Profiles** list, click **Create Policy Profile**.



The **Create Policy Profile** dialog box opens.



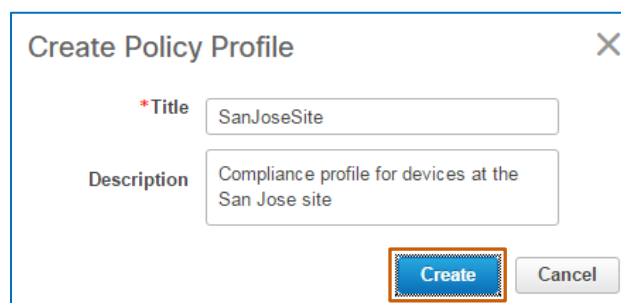
3. In the **Title** field, type a straightforward name so that others can recognize its use easily.



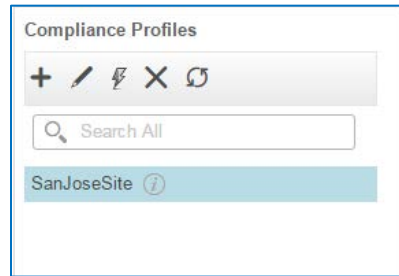
**Note:** The **Title** field name requires alphanumeric formatting without spaces. To indicate a space, use an underscore.

**Example:** ProfileName\_1

4. In the **Description** field, type a brief explanation of the use of the policy, and then click **Create**.



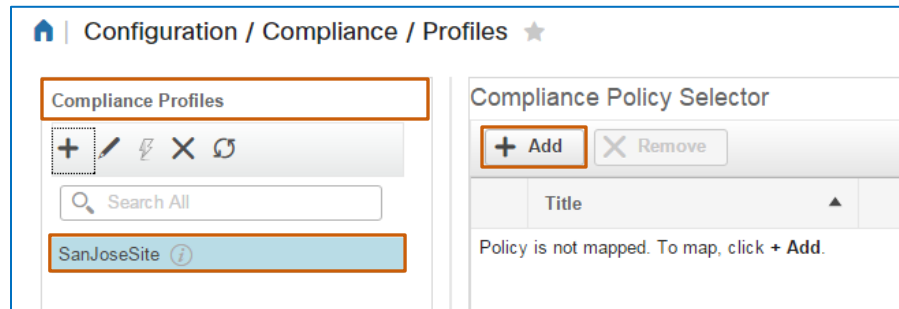
The system saves the policy and adds it to the **Compliance Profiles** list.



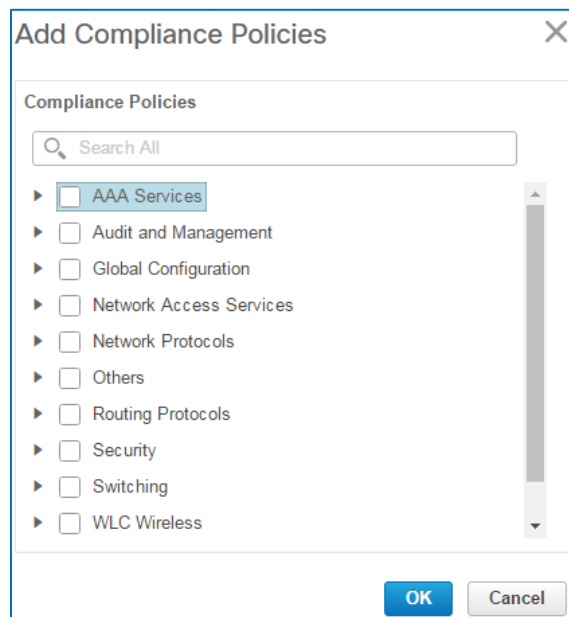
## Subtask 2: Add and Configure Compliance Policies

With the profile generated, you can configure and add the policies that you want to the profile.

1. In the **Compliance Policies** list, select the policy that you generated.
2. On the toolbar, click **Add**.



The **Add Compliance Policies** dialog box opens and lists categories of system-defined policies. It also provides the **User Defined** category, which lists all of the custom policies that system users have added.

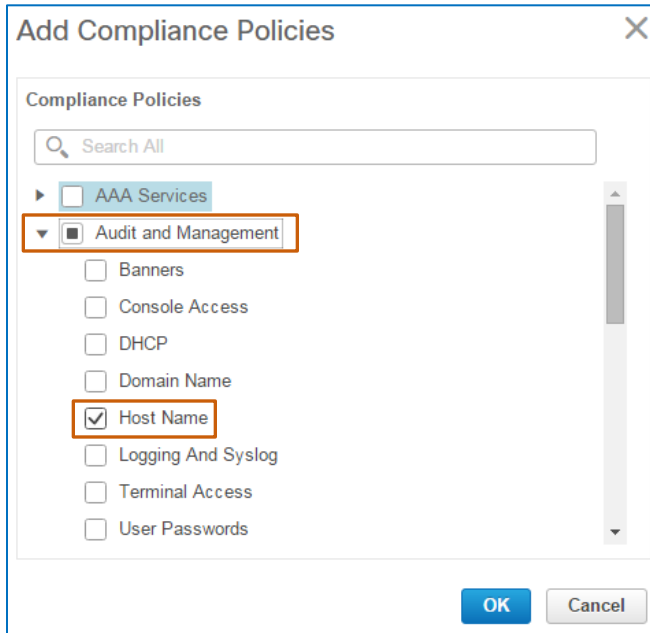


- To add policies to the profile, expand each applicable category and select each policy that you want, and then click **OK**.



**Tip:** To select all of the policies in a category, select the category name check box.

The following screenshots illustrate the policies included in the use case profile.



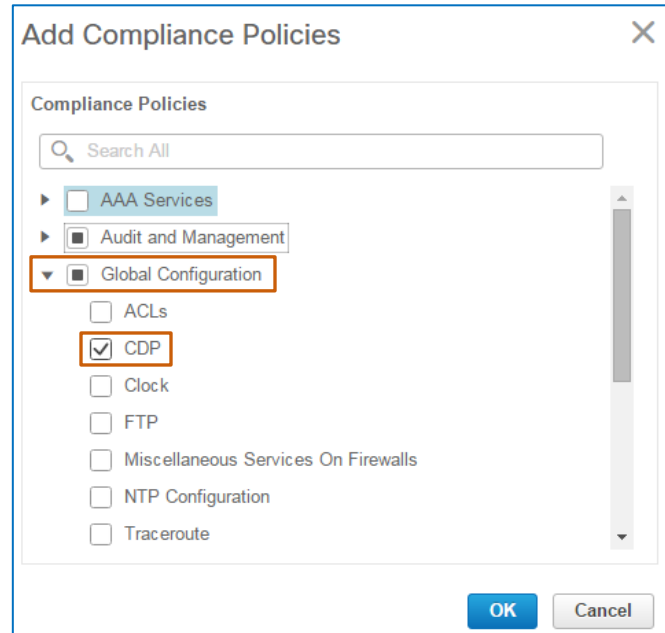
**Add Compliance Policies**

Compliance Policies

Search All

- ☐ AAA Services
- ☒ **Audit and Management**
  - ☐ Banners
  - ☐ Console Access
  - ☐ DHCP
  - ☐ Domain Name
  - ☒ **Host Name**
  - ☐ Logging And Syslog
  - ☐ Terminal Access
  - ☐ User Passwords

**OK** **Cancel**



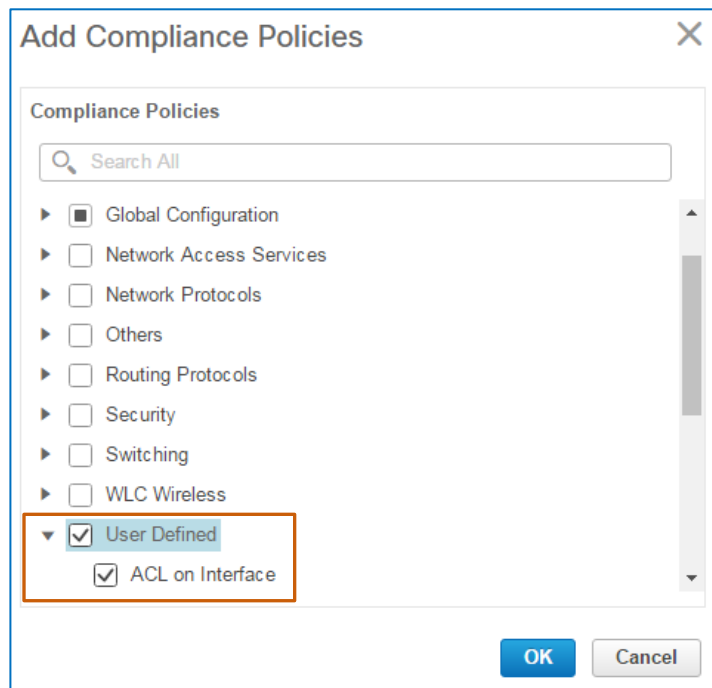
**Add Compliance Policies**

Compliance Policies

Search All

- ☐ AAA Services
- ☒ **Audit and Management**
  - ☒ **Global Configuration**
    - ☐ ACLs
    - ☒ **CDP**
    - ☐ Clock
    - ☐ FTP
    - ☐ Miscellaneous Services On Firewalls
    - ☐ NTP Configuration
    - ☐ Traceroute

**OK** **Cancel**



**Add Compliance Policies**

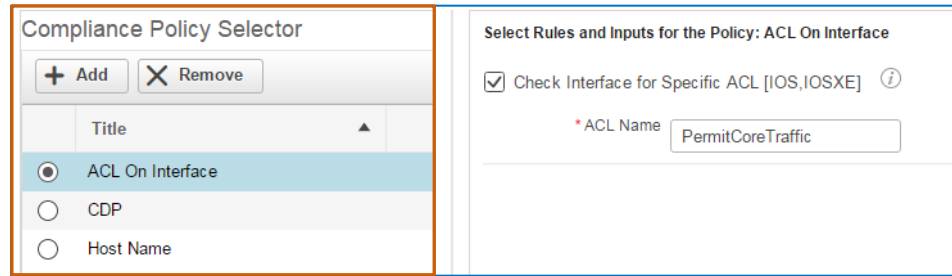
Compliance Policies

Search All

- ☒ **Global Configuration**
- ☐ Network Access Services
- ☐ Network Protocols
- ☐ Others
- ☐ Routing Protocols
- ☐ Security
- ☐ Switching
- ☐ WLC Wireless
- ☒ **User Defined**
  - ☒ **ACL on Interface**

**OK** **Cancel**

The **Compliance Policy Selector** section lists the policies that you selected.



4. For each policy that requires rule inputs, in the **Compliance Policy Selector** select the policy in the list, and then, in the **Select Rules and Inputs for the Policy** section, add or select the audit criteria.



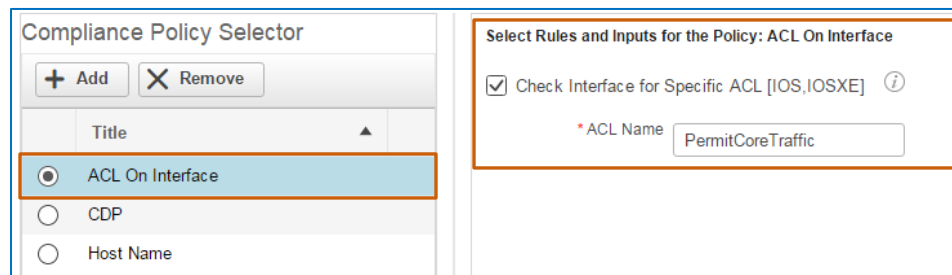
**Tip:** For policies with rules that do not require an input or have a default value, the system selects that rule by default, which means that the system will audit for the default value.

You can clear the check box of any policy rule that you do not need the audit to include.

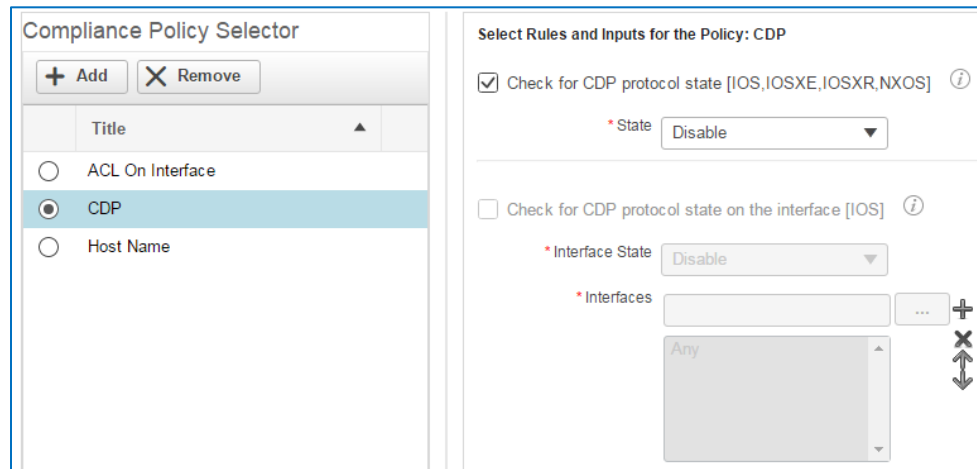
The following screenshots illustrate the completed policy audit criteria.

For the **ACL On Interface** policy, the system selects the rule by default and populates the **ACL Name** field with **PermitCoreTraffic**, which is the parameter that the network administrator added in the rule input.

Because **PermitCoreTraffic** is the name of the Access Control List that you are validating, you accept the default name.

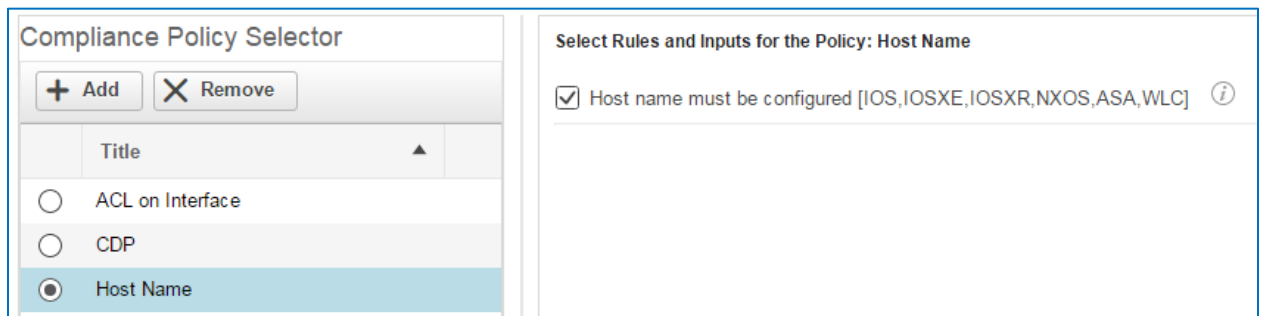


For the **CDP** policy, the system selects **Disable** CDP by default in order to report violations for each device that has the protocol enabled.



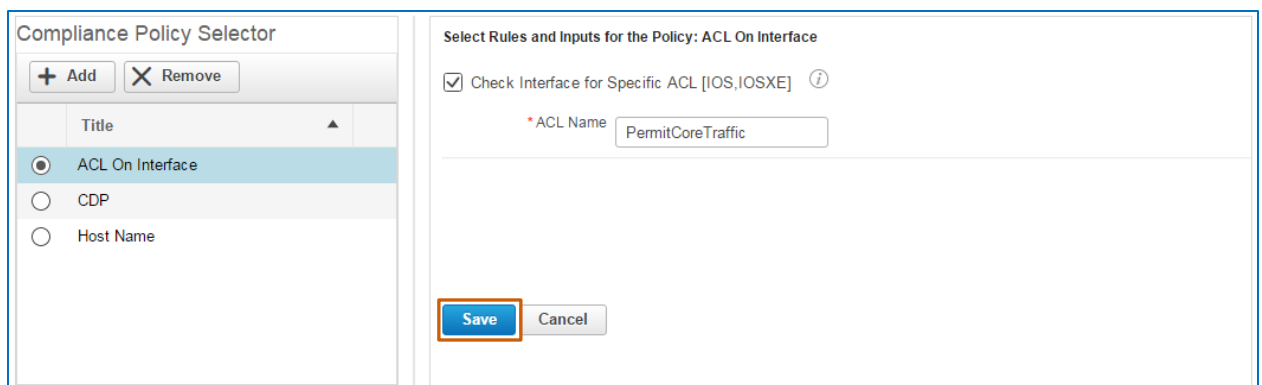
The screenshot shows the 'Compliance Policy Selector' interface. On the left, under 'Title', the 'CDP' option is selected with a radio button. On the right, under 'Select Rules and Inputs for the Policy: CDP', the rule 'Check for CDP protocol state [IOS, IOSXE, IOSXR, NXOS]' is checked. The 'State' dropdown is set to 'Disable'. Below it, the rule 'Check for CDP protocol state on the interface [IOS]' is unchecked. The 'Interface State' dropdown is also set to 'Disable'. The 'Interfaces' field is set to 'Any'.

For the **Host Name** policy, the system selects the criteria to determine whether each device is configured with a host name, and if not, reports a violation.



The screenshot shows the 'Compliance Policy Selector' interface. On the left, under 'Title', the 'Host Name' option is selected with a radio button. On the right, under 'Select Rules and Inputs for the Policy: Host Name', the rule 'Host name must be configured [IOS, IOSXE, IOSXR, NXOS, ASA, WLC]' is checked.

- For each policy to which you make changes, click **Save** to apply the changes to the policy.



The screenshot shows the 'Compliance Policy Selector' interface. On the left, under 'Title', the 'ACL On Interface' option is selected with a radio button. On the right, under 'Select Rules and Inputs for the Policy: ACL On Interface', the rule 'Check Interface for Specific ACL [IOS, IOSXE]' is checked. The 'ACL Name' field is set to 'PermitCoreTraffic'. At the bottom, the 'Save' button is highlighted with a red box.

With the profile configured, you can run the compliance audit.

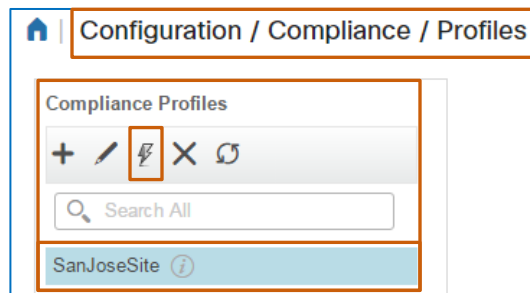
### Task 3: Run the Compliance Audit

With the policy configured, you run compliance audit. This function is available on the **Profiles** page.

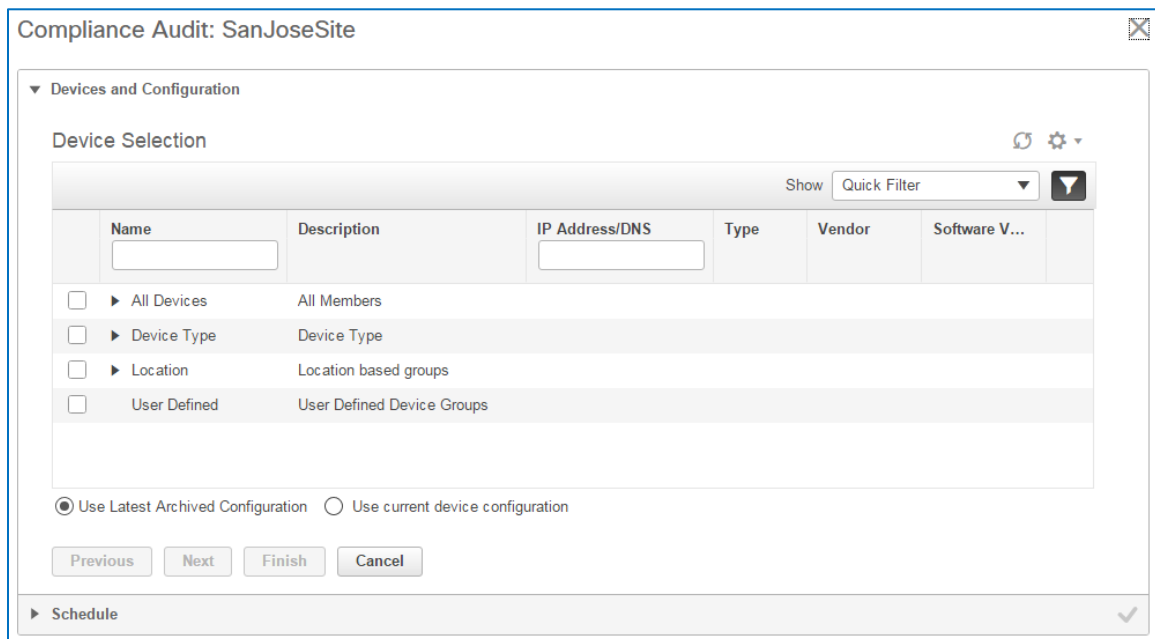
To run the compliance audit:

1. On the **Compliance | Profiles** page, in the **Compliance Profiles** list, select the profile that you want the audit to run.

2. On the toolbar, click **Run Compliance Audit** .



The system opens the **Compliance Audit** dialog box with a wizard to step you through the process, and displays the **Device Selection** page.



Compliance Audit: SanJoseSite

▼ Devices and Configuration

Device Selection

Show Quick Filter

Name	Description	IP Address/DNS	Type	Vendor	Software V...
<input type="checkbox"/> ▶ All Devices	All Members				
<input type="checkbox"/> ▶ Device Type	Device Type				
<input type="checkbox"/> ▶ Location	Location based groups				
<input type="checkbox"/> ▶ User Defined	User Defined Device Groups				

☒ Use Latest Archived Configuration
 ☐ Use current device configuration

Previous Next Finish Cancel

▶ Schedule

3. In the list, expand the category that contains the devices that you want to include and then select each device, device type, or group. Repeat this step to select all of the devices that you need.



**Important Note:** Regardless of the devices that you select in step 3, the system audits only those devices that meet the platform criteria that the system default policy defines or that a system user defined when configuring a custom policy.

When the audit does not evaluate devices because they are not included in the policy's platform criteria, it indicates the number of excluded devices in the audit results.

The number of excluded devices appears on the **Job Details and Violation Summary** page of the **Compliance Audit Violations Details** wizard in the **Ignore Count** column.

Compliance Audit Violation Details						
▼ Job Details and Violation Summary						
Job ID: 294647885		Devices (Audited/Non-Audited): 11/6		Policy Profile: NTPisCorrect		
Export as XLS		Export as CSV		Export as HTML		Show All
Policy Name	Selected Rules	Compliance State	Violation Count	Instance Count	Highest Severity	Ignore Count
NTP Configuration	3	<span style="color: red;">!</span>	27	27	<span style="color: orange;">!</span>	3

- To indicate the configuration that you want to audit, select **Use Latest Archived Configuration** or **Use current device configuration**.



**Important Note:** When auditing current configurations, the system collects each device's running configuration and then performs the audit, which can potentially affect system response.

Consider the number of devices that you are auditing and the potential for network congestion or latency due to the auditing process when determining the configuration to audit.

- To continue, click **Next**.

The system opens the **Schedule** page.

Compliance Audit: SanJoseSite

▶ Devices and Configuration

▼ Schedule

Job Name: Security\_Check\_Compliance Audit Job\_11\_30\_18\_114\_AM\_10\_31\_2015

Start Time: ☒ Now ☐ Date: 11/09/2015 11:30 AM

Recurrence: ☒ None ☐ Minute ☐ Hourly ☐ Daily ☐ Weekly ☐ Monthly ☐ Yearly

Previous Next Finish Cancel

- To change the job name, type it in the **Job Name** field.



**Tip:** Changing the job name can help make the type of audit more recognizable to other users when they review the list of completed audits on the **Jobs** page.

- To start the job immediately, click **Now** beside **Start Time**.
- To perform the audit, click **Finish**. The system initiates the audit job immediately.



**Note:** The system generates audits as jobs.

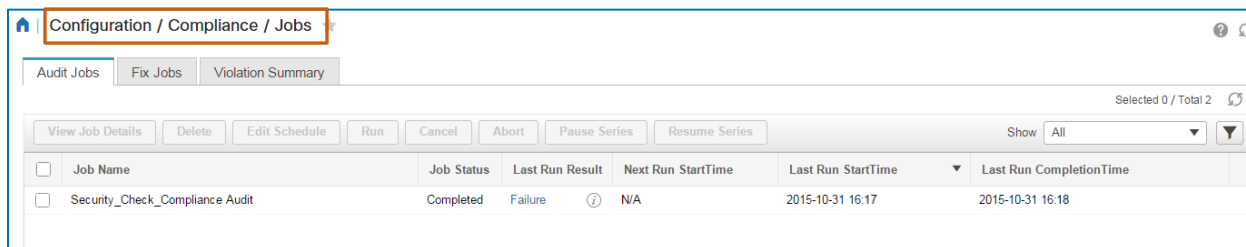
In this scenario, the job name indicates the type of audit that you are running, and you are running the job immediately. You monitor the job status and evaluate the audit results on the **Jobs** page.



## Task 4: Evaluate the Audit Results

On the **Configuration** menu, you navigate to the **Compliance | Jobs** page to evaluate audit results.

The page lists all of the running, completed, and recurring audit jobs, their statuses and their overall results.



Job Name	Job Status	Last Run Result	Next Run StartTime	Last Run StartTime	Last Run CompletionTime
Security_Check_Compliance Audit	Completed	Failure	N/A	2015-10-31 16:17	2015-10-31 16:18

### To evaluate the audit results:

- On the **Compliance | Jobs** page, on the **Audit Jobs** tab, in the list, find the audit that you started.

When the audit job is complete, in the **Last Run Result** column, the system indicates whether the job is successful, partially successful, or a failure.



**Note:** Results can indicate:

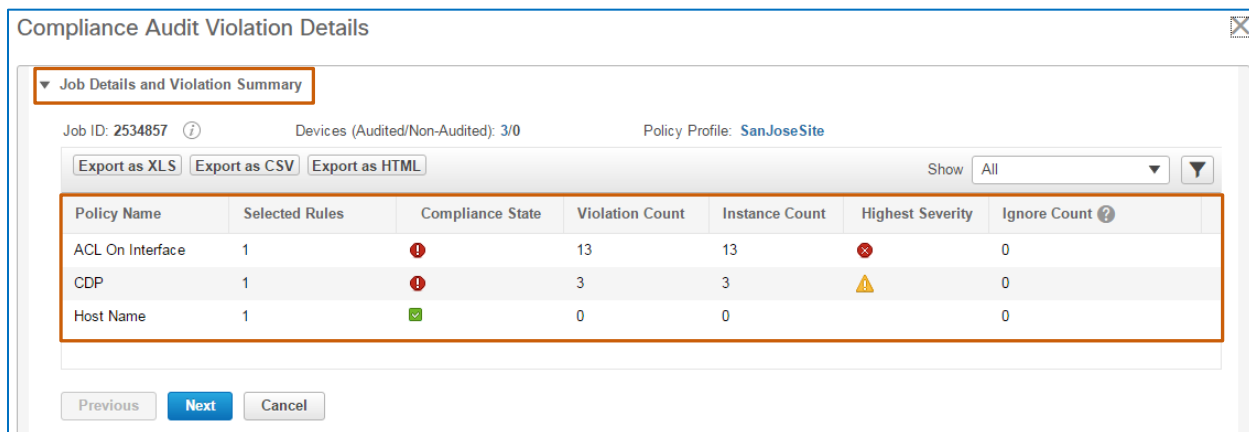
- ❖ **Failure:** The audit is reporting that one or more devices are non-compliant for a policy or policies.
- ❖ **Success:** The audit is reporting no violations.
- ❖ **Partial\_success:** The audit is reporting devices that are compliant and others that are ignored because they are not included in the policy platform or are not synchronized with the compliance server.



Last Run Result
Failure
Success
Partial_success


- To evaluate the audit details, in the job's **Last Run Result** field, click the status link.


The **Compliance Audit Violation Details** dialog box opens with the details of the audit.









Compliance Audit Violation Details

▼ Job Details and Violation Summary

Job ID: 2534857  Devices (Audited/Non-Audited): 3/0 Policy Profile: SanJoseSite

Export as XLS Export as CSV Export as HTML Show All 

Policy Name	Selected Rules	Compliance State	Violation Count	Instance Count	Highest Severity	Ignore Count 
ACL On Interface	1		13	13		0
CDP	1		3	3		0
Host Name	1		0	0		0

Previous Next Cancel

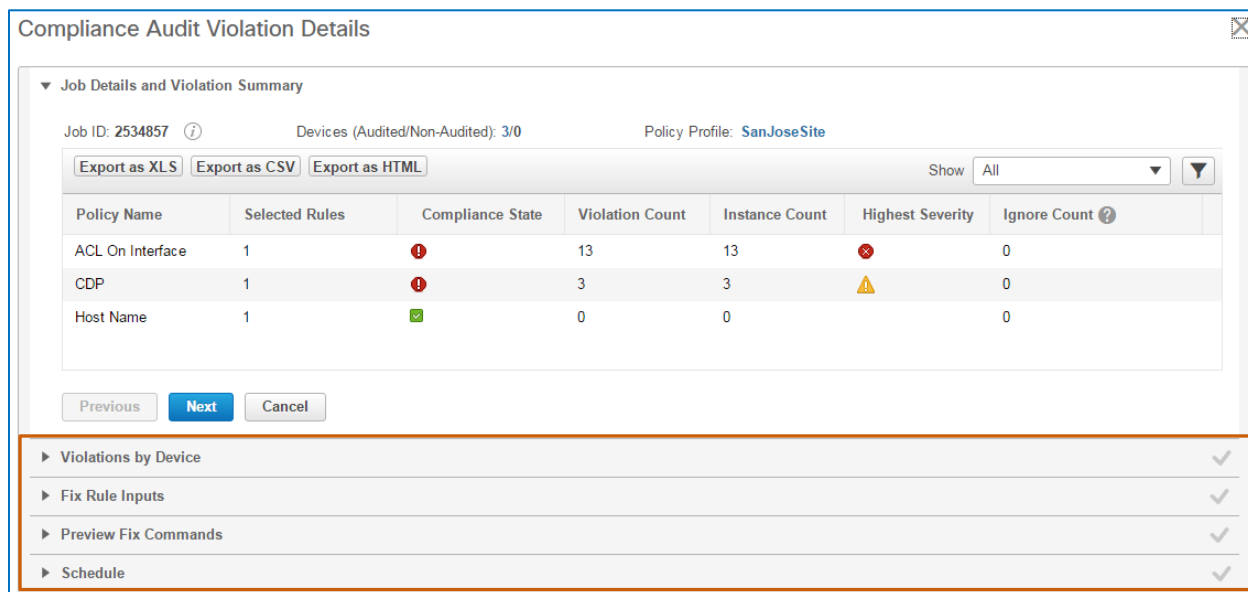
- On the **Job Details and Violation Summary** page, identify the policy that is reporting non-compliant devices.



**Important Note:** When you are planning to run a fix job, note the policy that is reporting the violations.


When validating that the fix job corrected the violations, you can sort the data by the policy name to review all of the devices affected by the correction more easily.


When the **Compliance Audit Violations Details** dialog box provides the ability to select devices and navigate to fix tasks, these features indicate that you can run a fix job to correct the violations on the non-compliant devices.









Compliance Audit Violation Details





▼ Job Details and Violation Summary

Job ID: 2534857  Devices (Audited/Non-Audited): 3/0 Policy Profile: SanJoseSite

Export as XLS Export as CSV Export as HTML Show All 

Policy Name	Selected Rules	Compliance State	Violation Count	Instance Count	Highest Severity	Ignore Count 
ACL On Interface	1		13	13		0
CDP	1		3	3		0
Host Name	1		0	0		0

Previous Next Cancel

- ▶ Violations by Device 
- ▶ Fix Rule Inputs 
- ▶ Preview Fix Commands 
- ▶ Schedule 

In this case, there are two policies reporting violations, the **ACL On Interface** and the **CDP** policies and the dialog box provides the ability to select devices and navigate to fix tasks.

Because of the critical security issue that the missing Access Control List causes, you want to send the **Fix CLI** commands by using the fix job to correct the non-compliant interface configurations immediately.

## Task 5: Initiate the Fix Job

To run the fix job, you note the policy reporting the violations that you plan to correct, which is the **ACL On Interface** policy. The system indicates the policy in the **Compliance Audit Violation Details** dialog box on the **Job Details and Violation Summary** page.

Compliance Audit Violation Details

Job ID: 2534857

Devices (Audited/Non-Audited): 3/0

Policy Profile: SanJoseSite

Export as XLS

Export as CSV

Export as HTML

Show

All

Policy Name	Selected Rules	Compliance State	Violation Count	Instance Count	Highest Severity	Ignore Count
ACL On Interface	1		13	13		0
CDP	1		3	3		0
Host Name	1		0	0		0

Previous

Next

Cancel

Violations by Device

Fix Rule Inputs

Preview Fix Commands

Schedule

You remain in the **Compliance Audit Violation Details** dialog box to initiate the fix job.

To initiate the fix job, follow these steps:

1. On the **Job Details and Violation Summary** page, click **Next**.

Compliance Audit Violation Details

Job ID: 2534857

Devices (Audited/Non-Audited): 3/0

Policy Profile: SanJoseSite

Export as XLS

Export as CSV

Export as HTML

Show

All

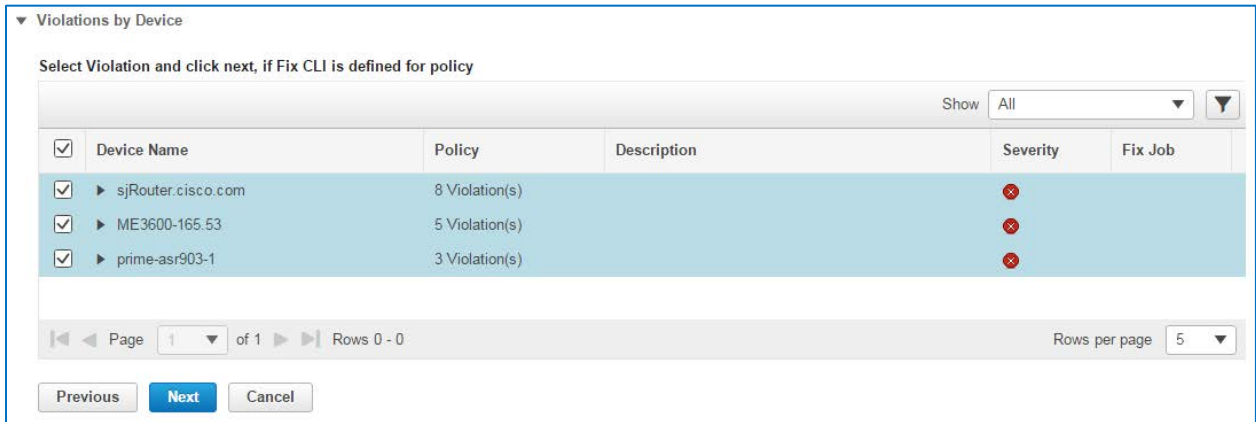
Policy Name	Selected Rules	Compliance State	Violation Count	Instance Count	Highest Severity	Ignore Count
ACL On Interface	1		13	13		0
CDP	1		3	3		0
Host Name	1		0	0		0

Previous

Next

Cancel

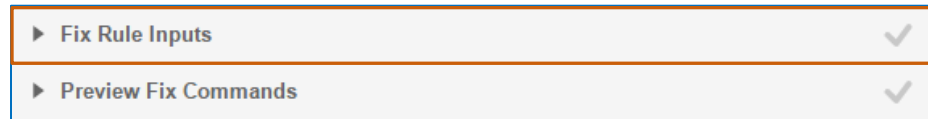
The **Violations by Device** page opens.



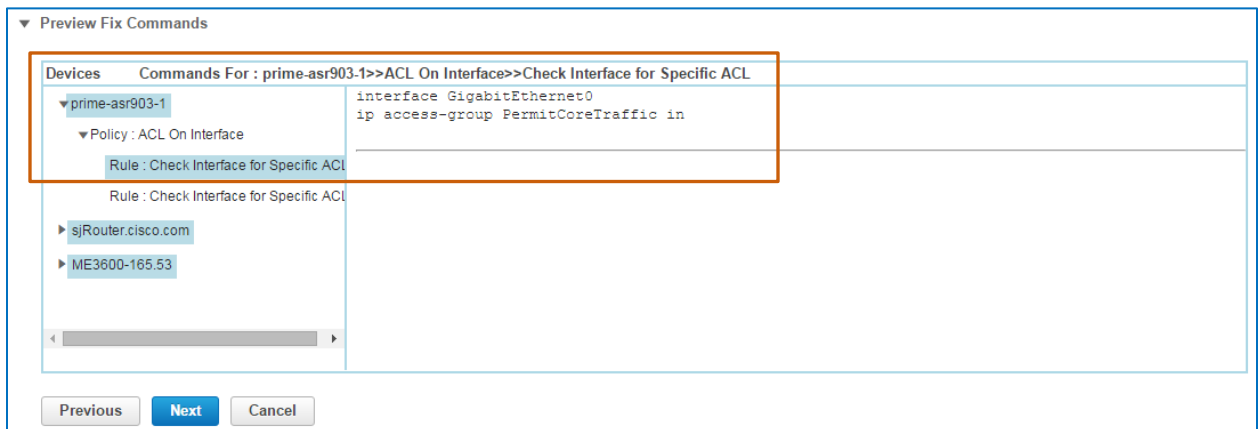
- On the **Violations by Device** page, find and select the devices reporting the violations that you need to correct, and then click **Next**.



**Note:** The **Fix Rule Inputs** page opens only for those policies in which one or more of the rule inputs are of a **Fix** scope.



The **Preview Fix Commands** page opens.



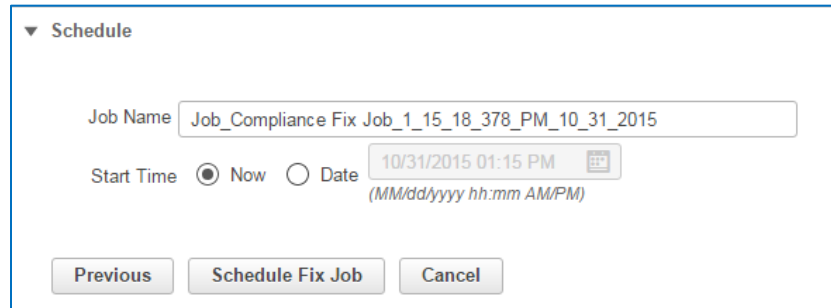
- On the **Preview Fix Commands** page, review the commands that the fix job will send to each device that you selected to determine if they are valid, and then click **Next**.



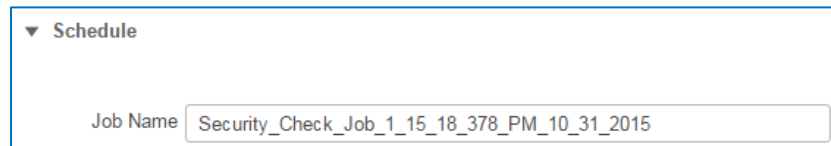
**Tip:** When you find that the **Fix CLI** commands are not in a condition to insert into device configurations, click **Cancel** to close the dialog box and stop the correction process.

Follow your business process to correct the commands, as needed.

The **Schedule** page opens.



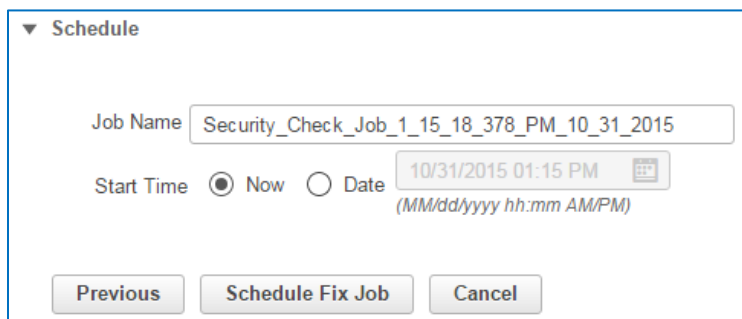
4. On the **Schedule** page, in the **Job Name** field, type a name that describes the job's purpose.



5. Because you want the system to run the fix job immediately, you accept the system default selection of **Now**.
6. To run the correction, click **Schedule Fix Job**. This action initiates the fix job, which the system lists and monitors on the **Fix Jobs** tab.

In this case, you scheduled a fix job to correct all of the configurations so that they contain the **PermitCoreTraffic** Access Control List.

The following screenshots illustrates the fix job that you are scheduling.

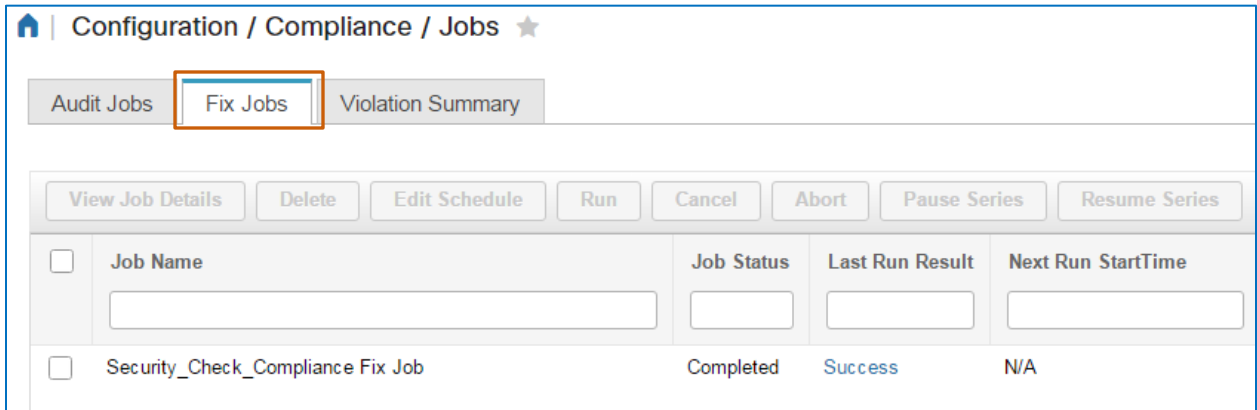


## Task 6: Validate the Fix Job

The system monitors fix jobs and reports their results on the **Fix Jobs** tab. The validation process includes:

1. On the **Fix Jobs** tab, validating that the fix job is successful.
2. On the **Audit Jobs** tab, rerunning the audit job and validate that the policy reporting violations is now reporting success.

To begin the validation process, you navigate to the **Fix Jobs** tab.



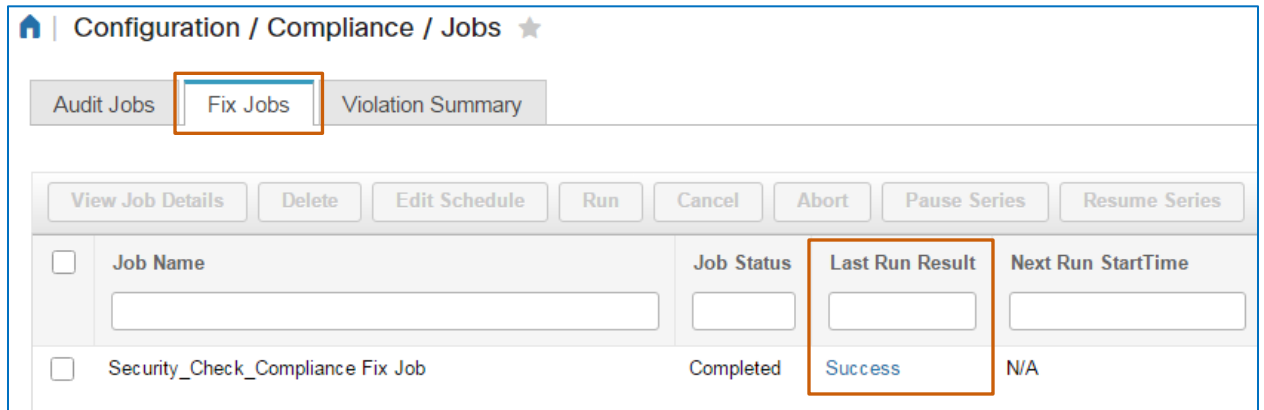
The screenshot shows the 'Configuration / Compliance / Jobs' page. The 'Fix Jobs' tab is highlighted with an orange box. Below the tabs are buttons for 'View Job Details', 'Delete', 'Edit Schedule', 'Run', 'Cancel', 'Abort', 'Pause Series', and 'Resume Series'. A table lists jobs with columns: Job Name, Job Status, Last Run Result, and Next Run StartTime. The first job is 'Security\_Check\_Compliance Fix Job' with status 'Completed' and result 'Success'.

Job Name	Job Status	Last Run Result	Next Run StartTime
Security_Check_Compliance Fix Job	Completed	Success	N/A

To evaluate and validate the fix job, follow these steps:

1. On the **Fix Jobs** tab, in the list, find the fix job.

When the fix job is complete, in the **Last Run Result** column, the system indicates whether the job is successful, partially successful, or a failure.



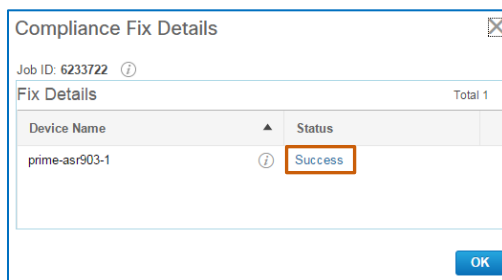
This screenshot is similar to the previous one, but the 'Last Run Result' field for the 'Security\_Check\_Compliance Fix Job' is highlighted with an orange box, showing the word 'Success'.

Job Name	Job Status	Last Run Result	Next Run StartTime
Security_Check_Compliance Fix Job	Completed	Success	N/A

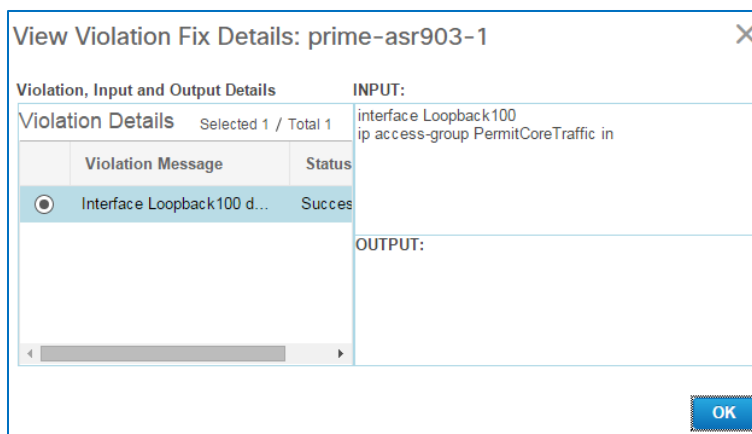
2. Because the fix job indicates a successful status, you want to evaluate the job details by clicking the **Success** link in the job's **Last Run Result** field.

The **Compliance Fix Details** dialog box opens.

- To review the commands that the fix job sent to the non-compliant interfaces, in the **Status** column, click **Success**.



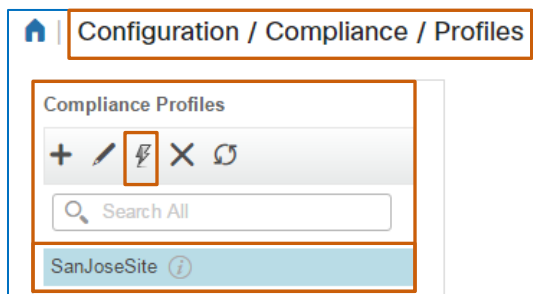
The **View Violation Fix Details** dialog box opens.



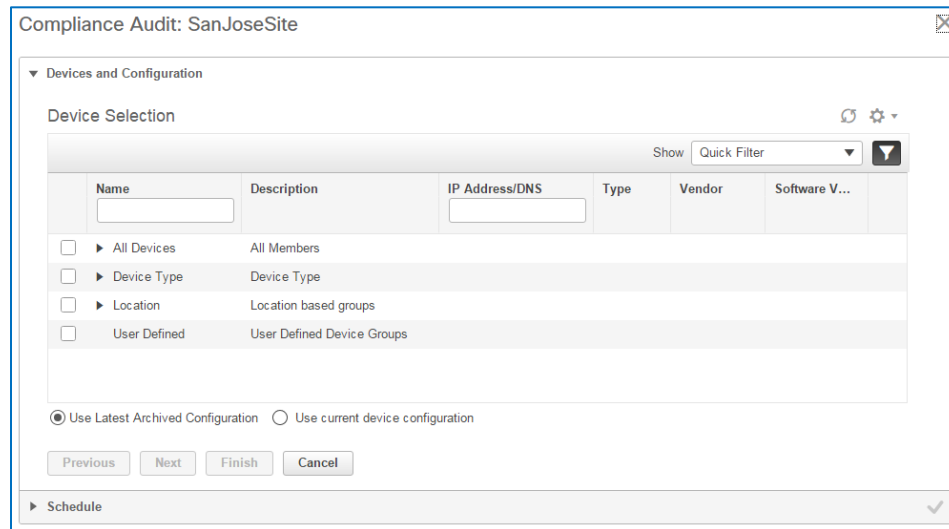
- To review the change that the fix job made on each applicable interface, in the **View Violation Fix Details** dialog box, click the option button of each violation in the list, and then click **OK** to close each dialog box.
- To validate that the devices have returned to a compliant state, navigate to the **Profiles** page, select the **SanJoseSite** compliance profile, and then, on the toolbar, click **Run**



**Compliance Audit**



The system opens the **Compliance Audit** dialog box with a wizard to step you through the process, and displays the **Device Selection** page.



The screenshot shows the 'Compliance Audit: SanJoseSite' dialog box. The 'Device Selection' tab is active. It features a table with columns: Name, Description, IP Address/DNS, Type, Vendor, and Software V... Below the table are four expandable categories: All Devices (All Members), Device Type (Device Type), Location (Location based groups), and User Defined (User Defined Device Groups). At the bottom, there are two radio buttons: 'Use Latest Archived Configuration' (selected) and 'Use current device configuration'. Navigation buttons 'Previous', 'Next', 'Finish', and 'Cancel' are also present.

6. In the list, expand each category and select the devices that you want to include, and then click **Use current device configuration**.



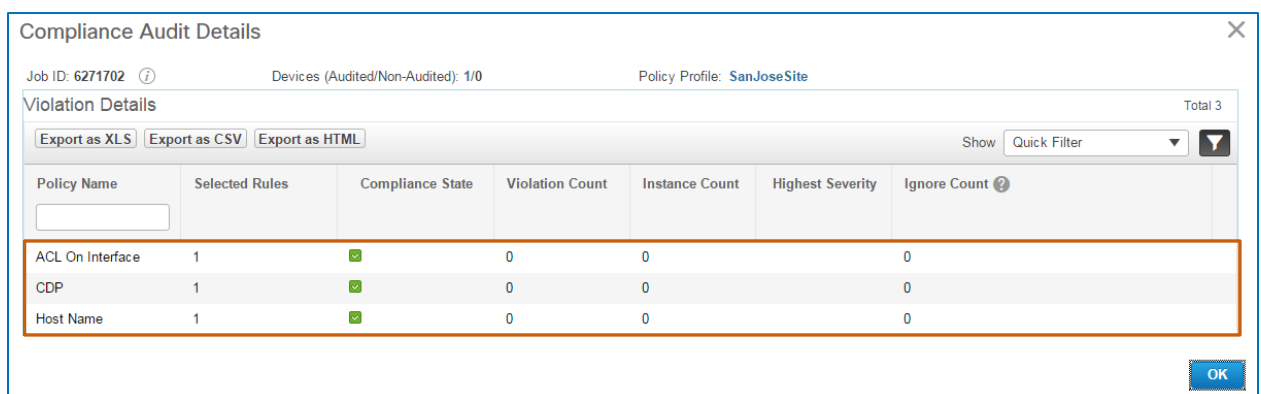
This image shows the two radio buttons from the previous screenshot. The 'Use current device configuration' option is selected and highlighted with an orange border.



**Important Note:** Ensure that when you rerun the audit to validate corrections, you are running it on the device's current running configuration.

For more information, [refer to the FAQ](#).

7. On the **Schedule** page, click **Now** to run the audit immediately, and then click **Finish**.
8. To validate the results, navigate to the **Jobs** page, and, when the job completes, click its **Success** link.
9. In **Compliance Audit Details** dialog box, verify that all of the policies listed indicate a compliant state by displaying a green indicator, and then click **OK** to close the dialog box.



The screenshot shows the 'Compliance Audit Details' dialog box. It displays job information: Job ID: 6271702, Devices (Audited/Non-Audited): 1/0, and Policy Profile: SanJoseSite. Below is a table titled 'Violation Details' with columns: Policy Name, Selected Rules, Compliance State, Violation Count, Instance Count, Highest Severity, and Ignore Count. The table shows three rows: ACL On Interface, CDP, and Host Name, all with a green checkmark in the Compliance State column. An 'OK' button is at the bottom right.

Policy Name	Selected Rules	Compliance State	Violation Count	Instance Count	Highest Severity	Ignore Count
ACL On Interface	1	✓	0	0		0
CDP	1	✓	0	0		0
Host Name	1	✓	0	0		0

With the **Compliance Audit Details** displaying a green indicator in the **Compliance State** for all of the policies that you expect to run without reporting failures, you have completed the scenario to audit device interfaces and ensured that they have returned to compliance.



# Video Demonstration

## *Watching Demonstrations*

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### To watch a demonstration:

- ❖ Click a link, which opens an MP4 file.

Based on your system and configuration, you might need to start the video manually.



**Notes:** Video download and streaming times can vary.  
Demonstrations do not include narration.

## Auditing Device Configurations

### Watch the Demonstration



To learn more about auditing device configurations, [watch the Auditing Device Configurations video demonstration](#).

Approximate runtime: **21:00**

# Frequently Asked Questions

## General

[What platforms support auditing functions?](#)

[What types of installations support auditing functions?](#)

[Why do I not see the compliance functionality in Prime Infrastructure?](#)

## Configuring a Custom Policy

[How can I use a rule input with a \*\*Fix\*\* scope in \*\*Fix CLI\*\* commands?](#)

[How do I configure a single policy that address multiple platforms and device types?](#)

[What would prompt me to add more than one rule to a policy?](#)

[When adding a rule, why is it helpful to complete all of the rule information?](#)

[When adding a series of condition and action statements in which a statement has a dependency on another statement, how do I indicate the order in which the system evaluates the conditions?](#)

[When adding condition and action statements, how can I apply values obtained in previous conditions to subsequent conditions?](#)

[When adding condition and action statements or \*\*Fix CLI\*\* commands, how do I trigger the system to populate variables with actual values?](#)

## Running the Compliance Audit

[What factors do I consider when auditing current device configurations?](#)

## Evaluating the Audit Job

[Why do the audit run results include violations that I cannot select for correction?](#)

## Validating the Fix Job

[After successfully running a \*\*Fix Job\*\*, why can rerunning the original audit on the \*\*Audit Jobs\*\* tab for validation purposes fail?](#)

[Where can I see a complete list of all of the violations that each policy associated with an audit has reported on devices?](#)

## Have Another Question?

For more information, [visit the Cisco Web site to review or download technical documentation.](#)

### What platforms support auditing functions?

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You can audit the following platforms:

- ❖ IOS, IOS-XR, IOS-XE
- ❖ NX-OS
- ❖ Adaptive Security Appliance (ASA )
- ❖ Wireless LAN controller (WLC)
- ❖ AireOS

[Return to questions](#)

### What types of installations support auditing functions?

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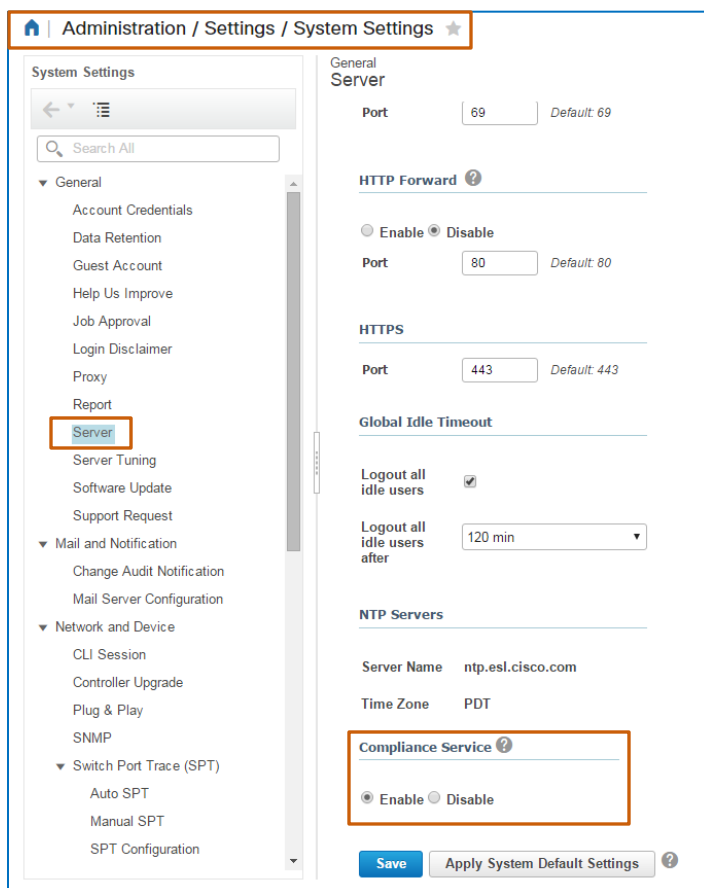
The following installation support auditing functions:

- ❖ Prime Infrastructure 3.0 and 3.1 Professional virtual appliance (OVA)
- ❖ Prime Infrastructure 3.1.2 Professional and Standard OVA configurations
- ❖ The Gen 2 UCS-based physical appliance

[Return to questions](#)

## Why do I not see the compliance functionality in Prime Infrastructure?

To have the compliance functionality available, an administrator needs to enable the compliance service in the system settings, and then log out and back in to Prime Infrastructure.



For more information, [refer to the Cisco Prime Infrastructure 3.1 Administrator Guide](#).

[Return to questions](#)

## How can I use a rule input with a Fix scope in Fix CLI commands?

When you configure a policy, you can include **Fix CLI** commands that a system user can choose to apply in a fix job to correct violations that the policy is reporting.

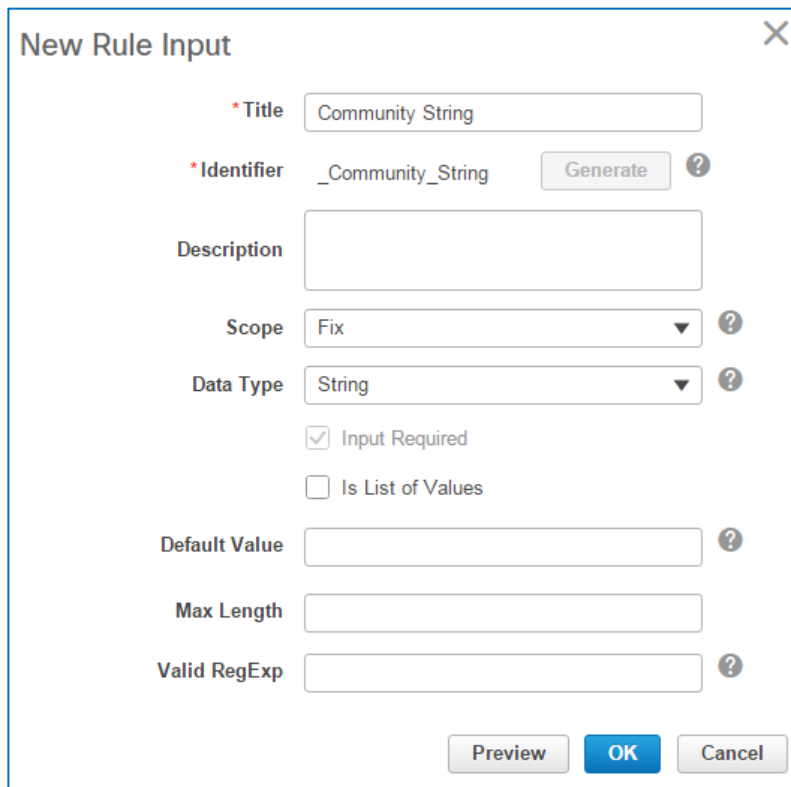
When you need to provide the user with the flexibility to change specific values in the **Fix CLI** commands, you can add a rule input with a **Fix** scope.

This way, the user can accept the default value of the rule input, or change the value when initiating the fix job, as needed.

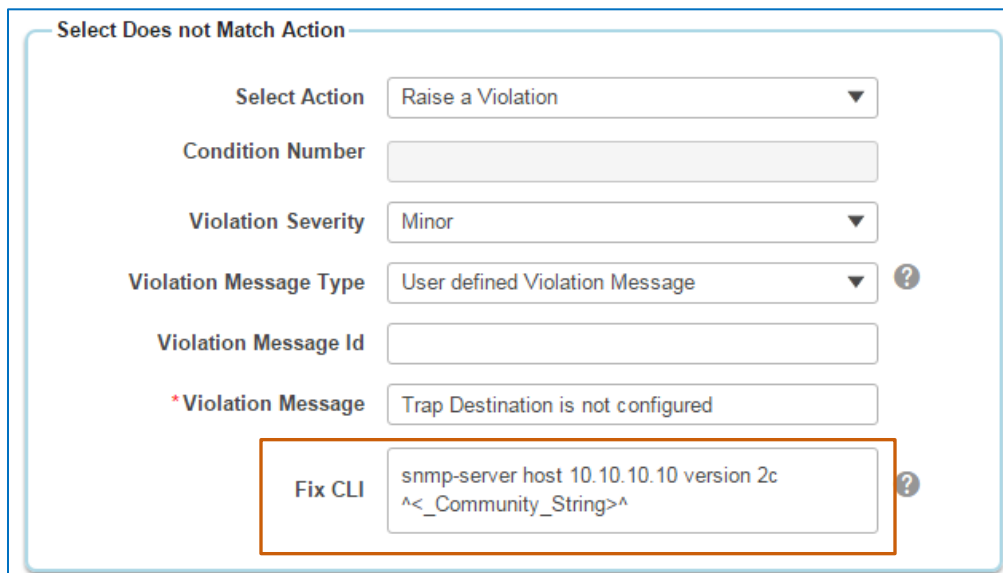


**Important Note:** You use **Fix** scope rule inputs in the **Fix CLI** commands fields in condition and action statements only.

The following screenshots illustrate a **Fix** scope rule input...



...and how you can apply the rule input in **Fix CLI** commands.



[Return to questions](#)

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### How do I configure a single policy that address multiple platforms and device types?

During auditing, the system applies the rules to and audits those devices that match the platforms that you select here, regardless of the types of devices that you select for an audit when configuring a profile.

You can select all of the platforms that are appropriate for the type of policy that you are configuring, and then you can write as many rules that you need to address different types of devices.

Consider the example of running an authentication, authorization, and accounting services (AAA) audit on IOS routers and Nexus switches. The IOS/IOS-XE platform on the IOS routers and the NX-OS platform on the Nexus switches use different syntaxes.

In the case, you can select both platforms, [and then configure two rules](#), one rule containing the applicable syntax to execute for the IOS/IOS-XE platform, the other rule containing the applicable syntax to execute for the NX-OS platform.

Then, the system will execute the applicable policy rule based on the devices that you select when you [run the audit](#).

[Return to questions](#)

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### What would prompt me to add more than one rule to a policy?

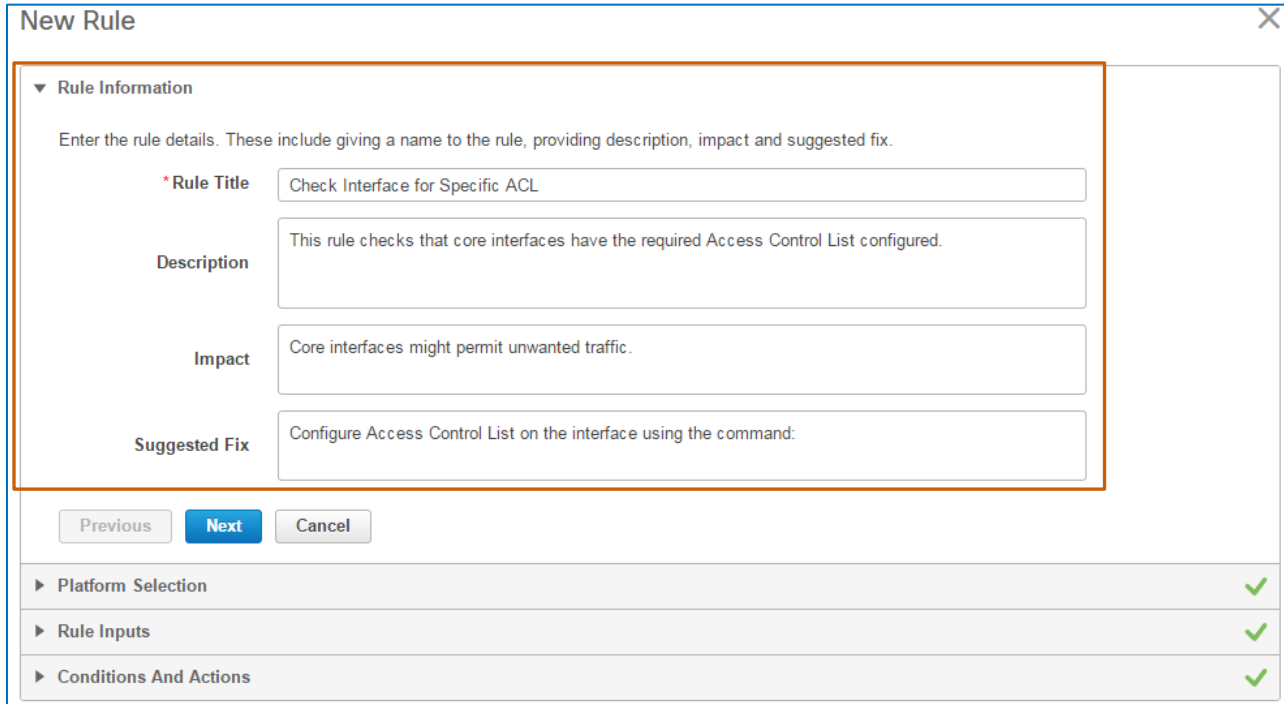
Adding multiple rules to a policy enables you to check diverse conditions on specific devices, operating systems, or platforms by using a single audit job.

For additional information, refer to the following FAQ. [How do I configure a single policy that address multiple platforms and device types?](#)

[Return to questions](#)

### When adding a rule, why is it helpful to complete all of the rule information?

Completing all of the fields on the **Rule Information** page of the **New Rule** wizard is helpful because these details are visible to users who are adding policies to profiles.



**New Rule**

▼ Rule Information

Enter the rule details. These include giving a name to the rule, providing description, impact and suggested fix.

\* Rule Title: Check Interface for Specific ACL

Description: This rule checks that core interfaces have the required Access Control List configured.

Impact: Core interfaces might permit unwanted traffic.

Suggested Fix: Configure Access Control List on the interface using the command:

Previous Next Cancel

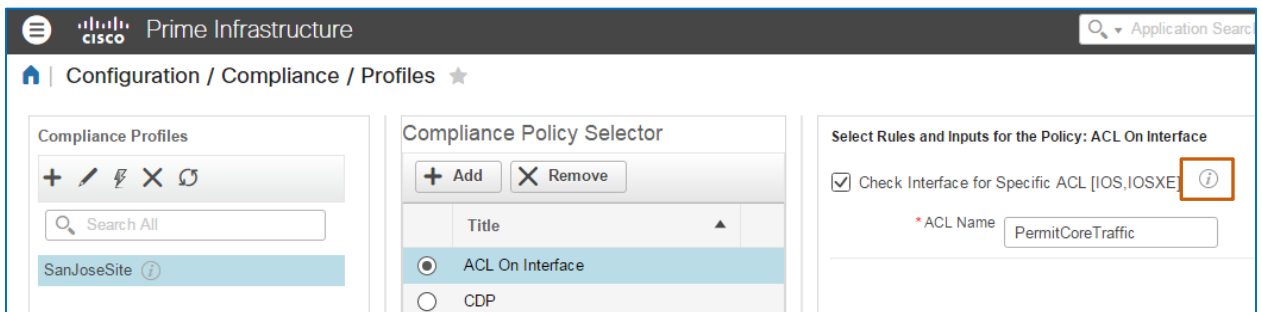
► Platform Selection ✓

► Rule Inputs ✓

► Conditions And Actions ✓

In some cases, users adding profiles might not have the system rights to access or see the **Policies** page to review the policy details there.

On the **Profiles** page, by pointing to the information button beside a policy...



Prime Infrastructure

Configuration / Compliance / Profiles

Compliance Profiles

+ / ✕ / 🔍 / 🔄

Search All

SanJoseSite ⓘ

Compliance Policy Selector

+ Add ✕ Remove

Title

ACL On Interface

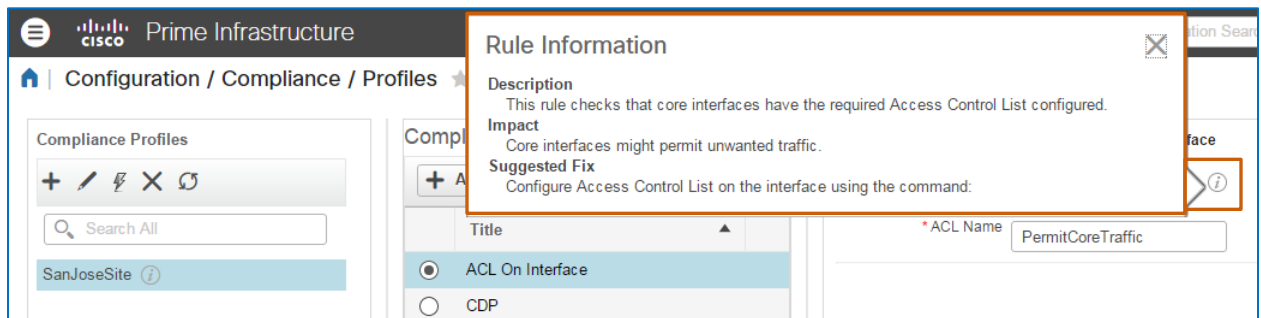
CDP

Select Rules and Inputs for the Policy: ACL On Interface

✓ Check Interface for Specific ACL [IOS,IOSXE] ⓘ

\* ACL Name: PermitCoreTraffic

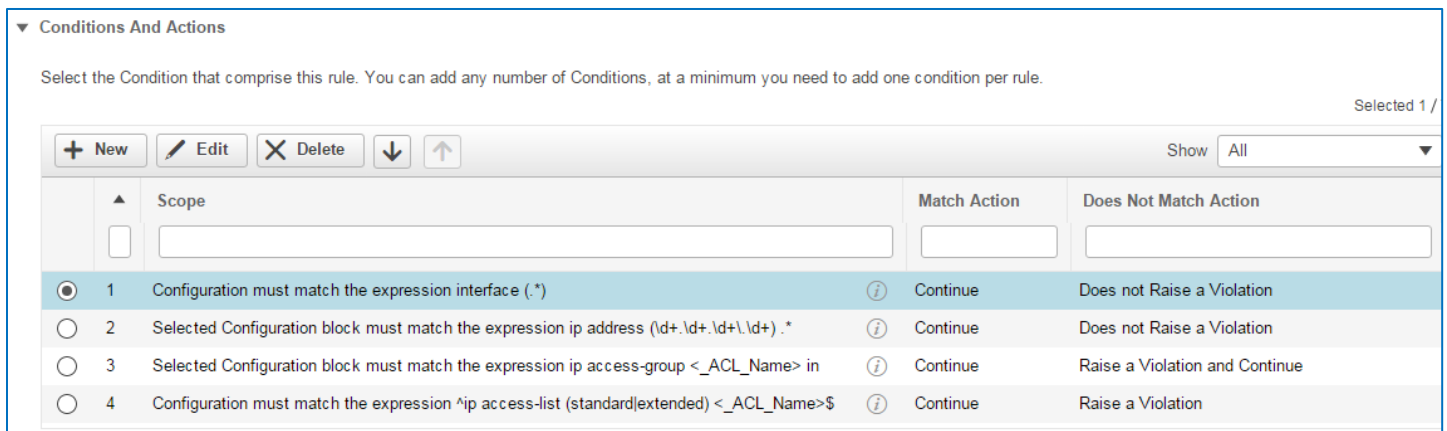
...users can see all of the rule information that you added, which can help them more easily determine whether they want to include the custom policies in the profile.



[Return to questions](#)

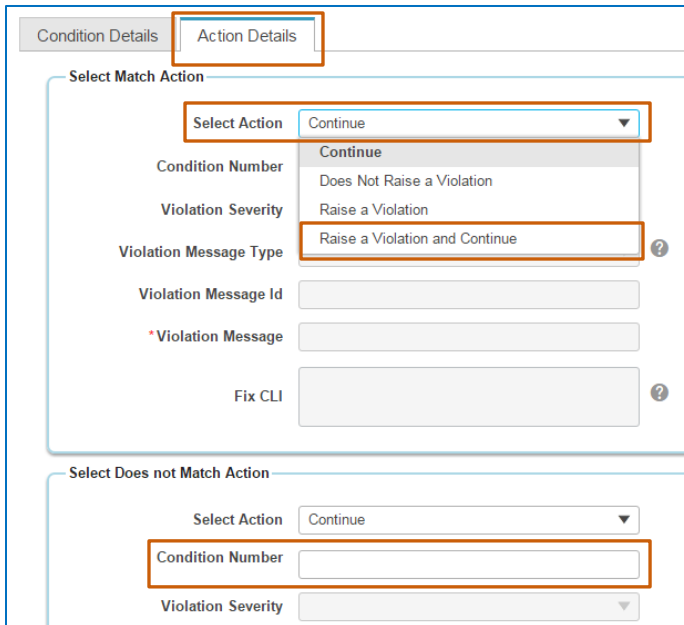
**When adding a series of condition and action statements in which a statement has a dependency on another statement, how do I indicate the order in which the system evaluates the conditions?**

When configuring condition and action statements, you can create dependencies among them based on the audit findings.

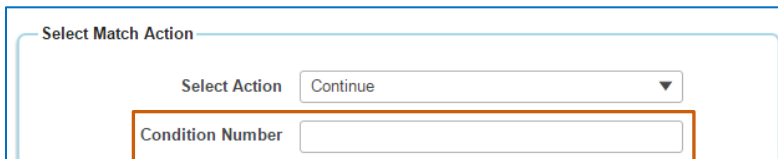




You can configure dependencies on the **Action Details** tab when the **Select Action** that you indicate is **Continue** or **Raise a Violation and Continue**. You can configure separate dependencies or the same dependency for matching and non-matching conditions.

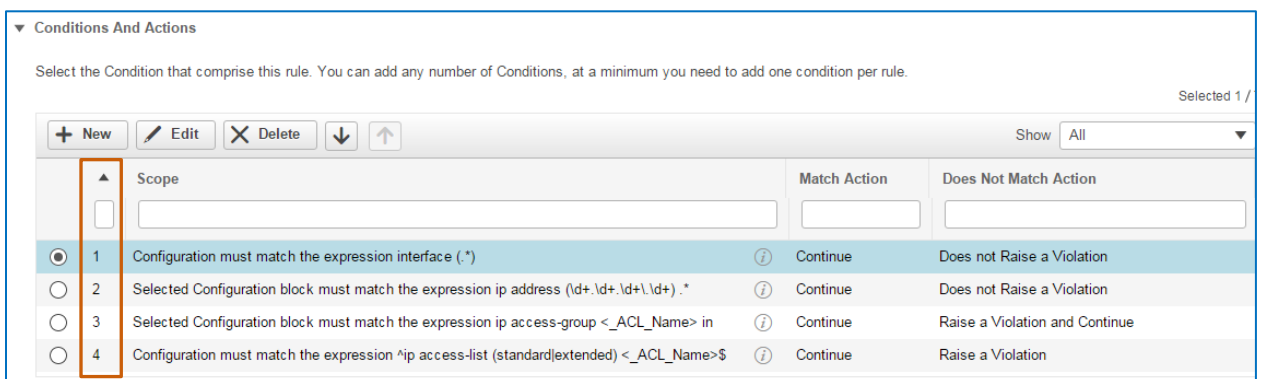


When you select one of these options, the **Condition Number** field becomes available for editing.



To indicate the next condition that you want the system to evaluate:

- ❖ In the **Condition Number** field, type the condition number as it appears in the list of conditions on the **Conditions And Actions** page of the wizard.



	Scope	Match Action	Does Not Match Action
1	Configuration must match the expression interface (.*)	Continue	Does not Raise a Violation
2	Selected Configuration block must match the expression ip address (\d+.\d+.\d+).\d+.*	Continue	Does not Raise a Violation
3	Selected Configuration block must match the expression ip access-group <_ACL_Name> in	Continue	Raise a Violation and Continue
4	Configuration must match the expression ^ip access-list (standard extended) <_ACL_Name>\$	Continue	Raise a Violation

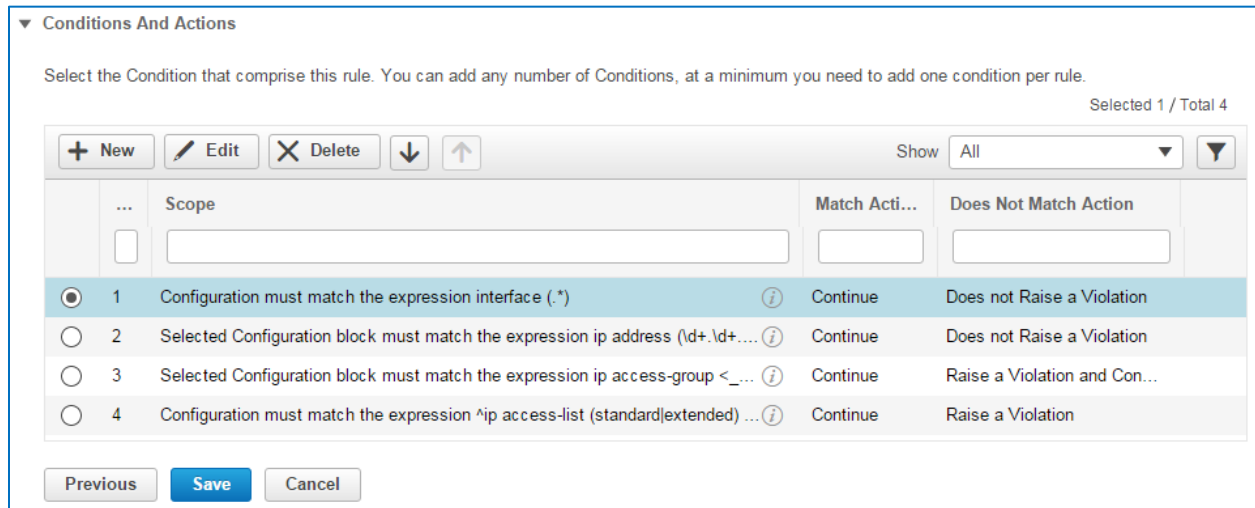


**Note:** When you leave the **Condition Number** field blank, the system progresses to the next statement as it appears in the series.

[Return to questions](#)

### When adding condition and action statements, how can I apply values obtained in previous conditions to subsequent conditions?

To answer the question, we are using the job aid scenario of auditing device interfaces to identify those with configurations that are either missing the ACL as an example. The policy rule includes a series of conditions.



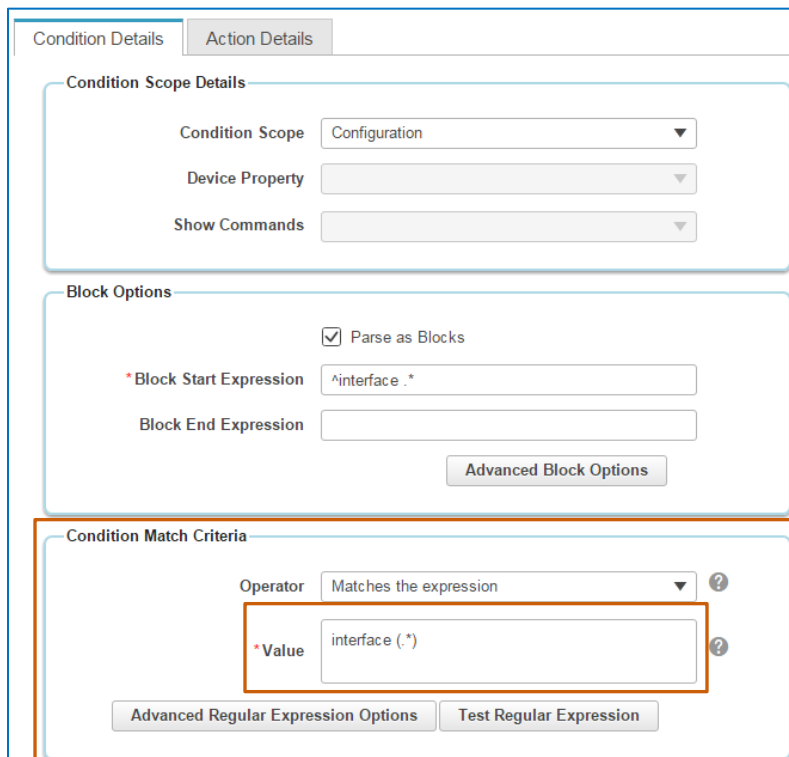
▼ Conditions And Actions

Select the Condition that comprise this rule. You can add any number of Conditions, at a minimum you need to add one condition per rule. Selected 1 / Total 4

Show ▼ All ▼

	Scope	Match Acti...	Does Not Match Action
<input checked="" type="radio"/>	1 Configuration must match the expression interface (.*)	Continue	Does not Raise a Violation
<input type="radio"/>	2 Selected Configuration block must match the expression ip address (ld+.ld+....	Continue	Does not Raise a Violation
<input type="radio"/>	3 Selected Configuration block must match the expression ip access-group <_...	Continue	Raise a Violation and Con...
<input type="radio"/>	4 Configuration must match the expression ^ip access-list (standard extended) ...	Continue	Raise a Violation

In the first condition, we write a statement that generates interface blocks and dynamically extracts each interface name from the running configuration of each device by using the regular expression value in the **Condition Match Criteria** section, in this case: interface (.\*)



Condition Details Action Details

Condition Scope Details

Condition Scope Configuration

Device Property

Show Commands

Block Options

☒ Parse as Blocks

\*Block Start Expression ^interface .\*

Block End Expression

Advanced Block Options

Condition Match Criteria

Operator Matches the expression

\*Value interface (.\*)

Advanced Regular Expression Options Test Regular Expression

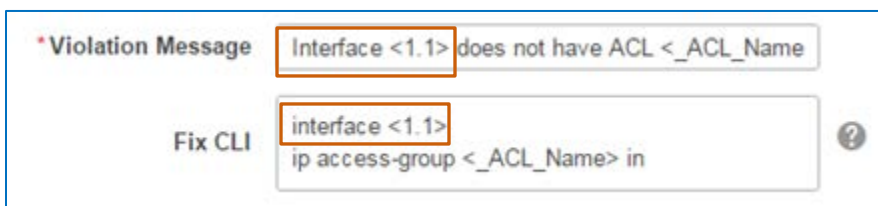
In the third condition, we write a statement action so that when the audit finds an interface that does not have the **PermitCoreTraffic** ACL, the system generates a violation message that specifies the actual name of the non-compliant interface.

And, in the **Fix CLI** command, we need the system to find the non-compliant interface and, in the device's running configuration, replace the incorrect commands with the **Fix CLI** commands.

To indicate the unique interface name in the message and command, you can type the variable **<n.m>** in which:

- ❖ **n** = The condition number
- ❖ **m** = The grep value found in the condition

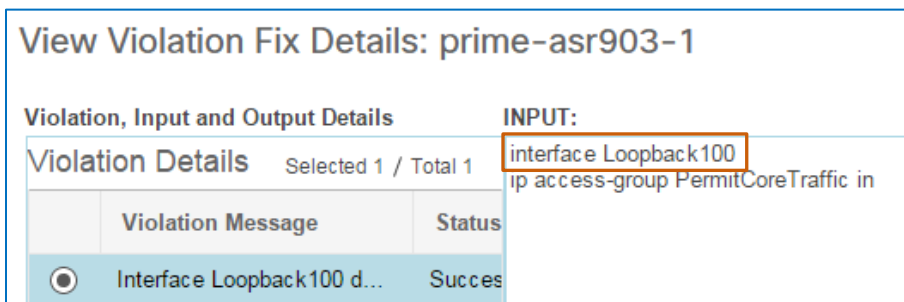
In this case, the variable **<1.1>** tells the system to obtain the interface name that the first condition extracted, and dynamically replace the variable with the interface name in the violation message and in the **Fix CLI** commands.



The following screenshot illustrates the violation message that appears in the audit results. In this message, the non-compliant interface name **Interface Loopback 100** is populated by the variable **<1.1>** by using grep.

Compliance Audit Violation Details																								
<div> Job Details and Violation Summary </div> <div> Violations by Device </div> <div> Select Violation and click next, if Fix CLI is defined for policy </div> <div> Show All </div> <table> <thead> <tr> <th><input checked="" type="checkbox"/></th><th>Device Name</th><th>Policy</th><th>Description</th><th>Severity</th></tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td><td>prime-asr903-1</td><td>1 Violation(s)</td><td></td><td>✖</td></tr> <tr> <td><input type="checkbox"/></td><td></td><td>ACL On Interface</td><td>1 Violation(s)</td><td>✖</td></tr> <tr> <td><input type="checkbox"/></td><td></td><td></td><td>Interface Loopback100 does not have ACL: PermitCoreTraffic Configured</td><td>✖</td></tr> </tbody> </table>					<input checked="" type="checkbox"/>	Device Name	Policy	Description	Severity	<input type="checkbox"/>	prime-asr903-1	1 Violation(s)		✖	<input type="checkbox"/>		ACL On Interface	1 Violation(s)	✖	<input type="checkbox"/>			Interface Loopback100 does not have ACL: PermitCoreTraffic Configured	✖
<input checked="" type="checkbox"/>	Device Name	Policy	Description	Severity																				
<input type="checkbox"/>	prime-asr903-1	1 Violation(s)		✖																				
<input type="checkbox"/>		ACL On Interface	1 Violation(s)	✖																				
<input type="checkbox"/>			Interface Loopback100 does not have ACL: PermitCoreTraffic Configured	✖																				

The variable also populates the **Fix CLI** command with the interface name.



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### When adding condition and action statements or Fix CLI commands, how do I trigger the system to populate variables with actual values?

In order for the system to populate a variable with an actual value, you must enclose the variable in less than and greater than symbols.

In the screenshot below, because the rule input is of execution scope, the variable **\_ACL\_Name** appears in less than and greater than symbols in the **Condition Match Criteria | Value** field, as follows: **<\_ACL\_Name>**

The symbols trigger the system to replace the variable with the actual value that the rule input defines.

In this example, the system populates the **<\_ACL\_Name>** variable with **PermitCoreTraffic** because, in the rule input that we added, we defined the identifier **\_ACL\_Name**, which becomes the variable, with a default value of **PermitCoreTraffic**.

New Conditions And Actions

Condition Details

Action Details

Condition Scope Details

Condition Scope

Previously Matched Blocks

Device Property

Show Commands

Block Options

Parse as Blocks

Block Start Expression

Block End Expression

Advanced Block Options

Condition Match Criteria

Operator

Matches the expression

Value

ip access-group <\_ACL\_Name> in

Advanced Regular Expression Options

Test Regular Expression

OK

Cancel

New Rule Input

Title

ACL Name

Identifier

\_ACL\_Name

Generate

?

Description

Name of Access Control List

Scope

Execution

?

Data Type

String

?

Input Required

Is List of Values

Accept Multiple Values

?

Default Value

PermitCoreTraffic

?

Max Length

Valid RegExp

?

Preview

OK

Cancel

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### What factors do I consider when auditing current device configurations?

When auditing current configurations, the system collects each device's running configuration and then performs the audit, which can potentially affect system response.

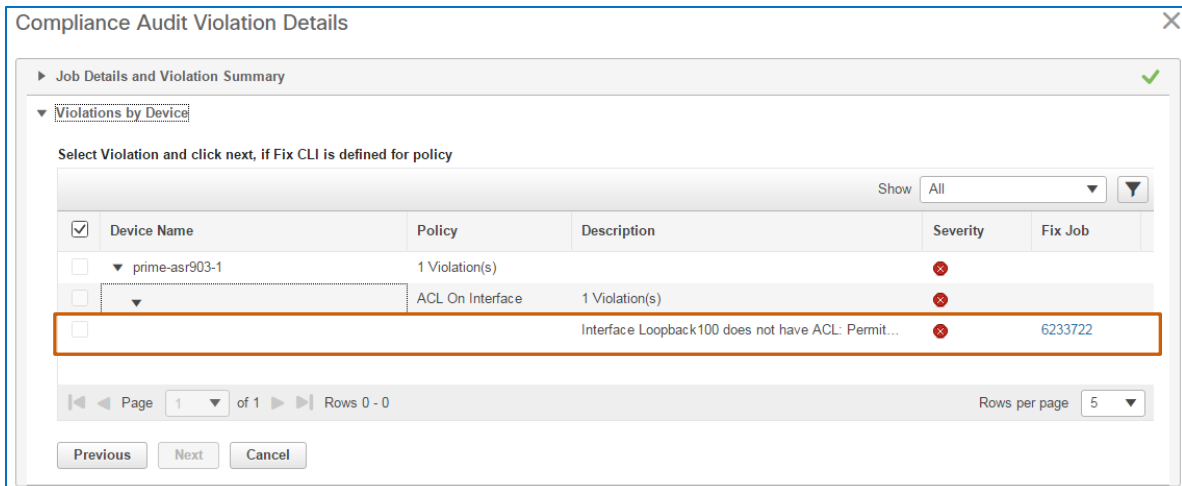
Consider the number of devices that you are auditing and the potential for network congestion or latency due to the auditing process when determining the configuration to audit.

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### Why do the audit run results include violations that I cannot select for correction?

You cannot select a violation for correction when:

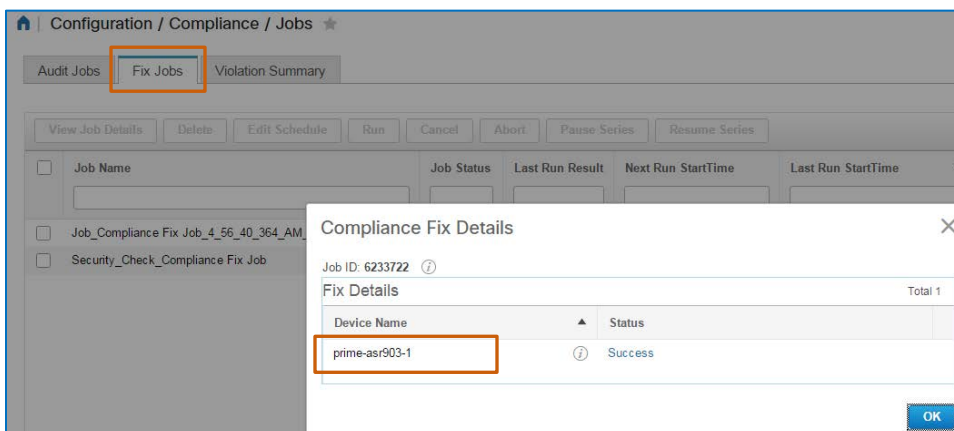
- ❖ The policy that identified the violation does not provide **Fix CLI** commands to correct the problem.
- ❖ A system user ran a fix job previously. In that case, you cannot select the device and the **Job ID** number link is available in the **Fix Job** column...



The screenshot shows the 'Compliance Audit Violation Details' window. It displays a table of violations. The first violation is for 'prime-asr903-1' with a severity of '1 Violation(s)'. The second violation is for 'ACL On Interface' with a severity of '1 Violation(s)'. The third violation is for 'Interface Loopback100 does not have ACL: Permit...' with a severity of '1 Violation(s)' and a 'Fix Job' link '6233722'. This row is highlighted with a red border.

Device Name	Policy	Description	Severity	Fix Job
prime-asr903-1	1 Violation(s)		1 Violation(s)	
ACL On Interface	1 Violation(s)		1 Violation(s)	
Interface Loopback100 does not have ACL: Permit...	1 Violation(s)		1 Violation(s)	6233722

...which corresponds to the number of the job on the **Fix Jobs** tab.



The screenshot shows the 'Configuration / Compliance / Jobs' window. The 'Fix Jobs' tab is selected. It displays a table of jobs. The first job is 'Job\_Compliance Fix Job\_4\_56\_40\_364\_AM' with a status of 'Success'. The second job is 'Security\_Check\_Compliance Fix Job' with a status of 'Success'. The 'Fix Details' window is open, showing the details for job '6233722'. It lists the device name 'prime-asr903-1' and the status 'Success'.

Job Name	Job Status	Last Run Result	Next Run StartTime	Last Run StartTime
Job_Compliance Fix Job_4_56_40_364_AM	Success			
Security_Check_Compliance Fix Job	Success			

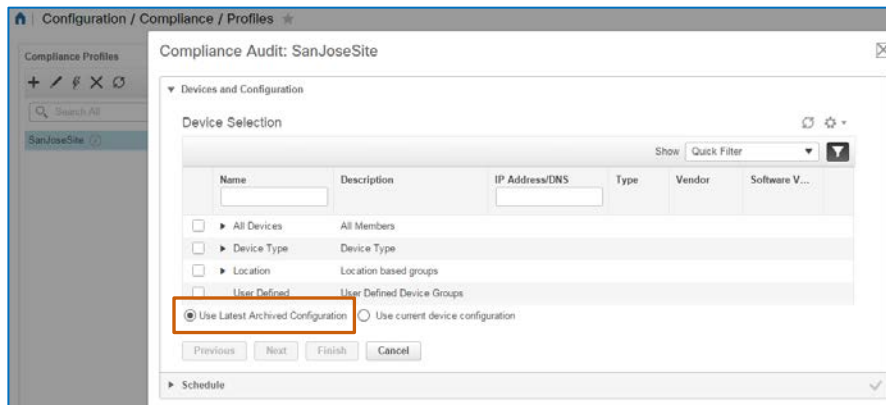
Device Name	Status
prime-asr903-1	Success

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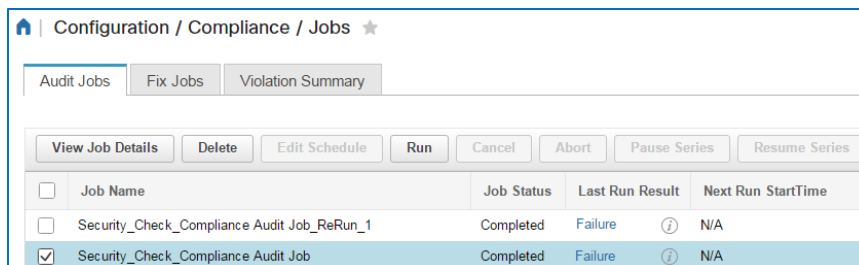
## After successfully running a Fix Job, why can rerunning the original audit on the Audit Job tab for validation purposes fail?

When a user initially runs the audit job, that user selects whether to audit the current running configuration or the most recently archived configuration.

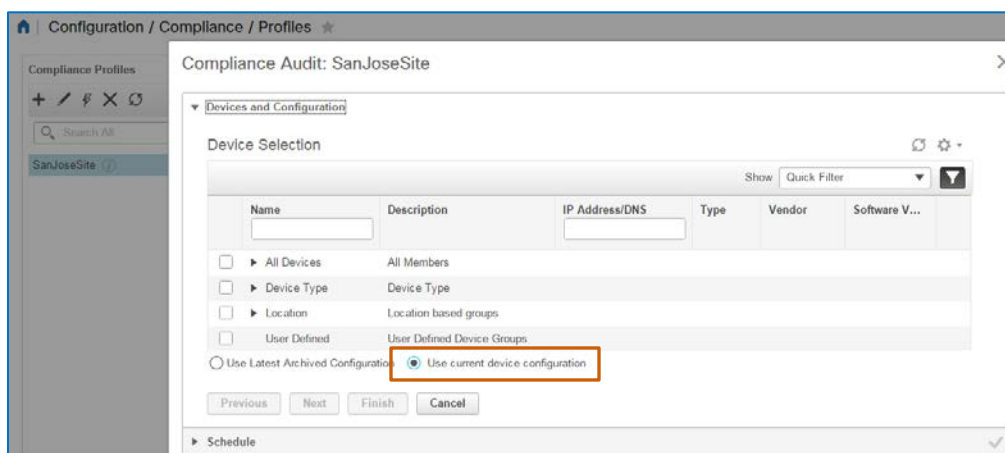
If the user audited the latest archived configuration, as illustrated in the following screenshot...



...when you rerun the same audit job on the **Jobs** page, you are auditing the archived configuration again.



To run the audit job for updated results, you need to return to the **Profiles** page and run the audit using the current device configuration, as illustrated in the following screenshot.



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## Where can I see a complete list of all of the violations that each policy associated with an audit has reported on devices?

To see a complete violation list, navigate to the **Jobs** page | **Violation Summary** tab.

The page lists each profile and policy name, and the device that the audit found non-compliant. Because a single device might have several non-compliant issues in its running configuration that different policies or different audits have reported, this list provides an alternative method of evaluating issues at a device, policy, or profile level.

The list also indicates whether an issue is capable of being corrected (**Fixable?** column) and whether a successful fix job was run that corrected the problem (**Fixed?** column).

Configuration / Compliance / Jobs

Audit Jobs
Fix Jobs
Violation Summary

Violation Report CSV
Go
Show All

Device Name	Profile Name	Audit Job Id	Policy Name	Rule Name	Rule Severity	Fixable?	Fixed?	Violation Message
RTR-2911-BR3.p... <i>i</i>	snmp	8195857	My_second_SNMP...	trap and log <i>i</i>	Minor	Yes	Yes	Undefined Trap detination
WAN-RTR-2.prim... <i>i</i>	Corporate-Se...	8175625	Miscellaneous Serv...	Enable SCP Server <i>i</i>	Minor	Yes	No	SCP server Disabled on the device.
WAN-RTR-2.prim... <i>i</i>	Corporate-Se...	8175625	Miscellaneous Serv...	Disable X.25 PA... <i>i</i>	Critical	No	No	X.25 PAD service is 'Enabled'.
WAN-RTR-2.prim... <i>i</i>	Corporate-Se...	8175625	Miscellaneous Serv...	Disable MOP (M... <i>i</i>	Minor	No	No	MOP enabled on the device.

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