



Red Hat Insights 1-latest

Monitoring and Reacting to Configuration Changes Using Policies

How to create policies to detect inventory configuration changes and send email notifications

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How to create policies to detect inventory configuration changes and send email notifications

Red Hat Customer Content Services

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Abstract

This document provides an overview of the Policies service and explains how to create a policy to detect system configuration changes and be notified by email. Red Hat is committed to replacing problematic language in our code, documentation, and web properties. We are beginning with these four terms: master, slave, blacklist, and whitelist. Because of the enormity of this endeavor, these changes will be implemented gradually over several upcoming releases. For more details, see our CTO Chris Wright's message.

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CHAPTER 1. RED HAT INSIGHTS POLICIES SERVICE OVERVIEW

Policies evaluate system configurations in your environment, and can send notifications when changes occur. Policies you create are applicable to all systems in your Insights inventory. You can create and manage policies using the Red Hat Insights for Red Hat Enterprise Linux user interface in the Red Hat Hybrid Cloud Console, or using the Insights API.

Policies can assist you by managing tasks such as:

- Raising an alert when particular conditions occur in your system configuration.
- Emailing a team when security packages are out of date on a system.

Using policies to monitor configuration changes in your inventory and notifying by email requires:

- Setting user email preferences (if not already set).
- Creating a policy to detect configuration changes as a trigger and selecting email as the trigger action.



NOTE

- Configure User Access in [Red Hat Hybrid Cloud Console](#) > the **Settings** icon (⚙️) > [Identity & Access Management](#) > [User Access](#) > [Users](#).
- See [User Access Configuration Guide for Role-based Access Control \(RBAC\)](#) for more information about this feature and example use cases.

1.1. USER ACCESS SETTINGS IN THE RED HAT HYBRID CLOUD CONSOLE

User Access is the Red Hat implementation of role-based access control (RBAC). Your Organization Administrator uses User Access to configure what users can see and do on the Red Hat Hybrid Cloud Console (the console):

- Control user access by organizing roles instead of assigning permissions individually to users.
- Create groups that include roles and their corresponding permissions.
- Assign users to these groups, allowing them to inherit the permissions associated with their group's roles.

1.1.1. Predefined User Access groups and roles

To make groups and roles easier to manage, Red Hat provides two predefined groups and a set of predefined roles.

1.1.1.1. Predefined groups

The **Default access group** contains all users in your organization. Many predefined roles are assigned to this group. It is automatically updated by Red Hat.



NOTE

If the Organization Administrator makes changes to the **Default access** group its name changes to **Custom default access** group and it is no longer updated by Red Hat.

The **Default admin access** group contains only users who have Organization Administrator permissions. This group is automatically maintained and users and roles in this group cannot be changed.

On the Hybrid Cloud Console navigate to [Red Hat Hybrid Cloud Console > the Settings icon \(⚙️\) > Identity & Access Management > User Access > Groups](#) to see the current groups in your account. This view is limited to the Organization Administrator.

1.1.1.2. Predefined roles assigned to groups

The **Default access** group contains many of the predefined roles. Because all users in your organization are members of the **Default access** group, they inherit all permissions assigned to that group.

The **Default admin access** group includes many (but not all) predefined roles that provide update and delete permissions. The roles in this group usually include **administrator** in their name.

On the Hybrid Cloud Console navigate to [Red Hat Hybrid Cloud Console > the Settings icon \(⚙️\) > Identity & Access Management > User Access > Roles](#) to see the current roles in your account. You can see how many groups each role is assigned to. This view is limited to the Organization Administrator.

See [User Access Configuration Guide for Role-based Access Control \(RBAC\)](#) for additional information.

1.1.2. Access permissions

The **Prerequisites** for each procedure list which predefined role provides the permissions you must have. As a user, you can navigate to [Red Hat Hybrid Cloud Console > the Settings icon \(⚙️\) > My User Access](#) to view the roles and application permissions currently inherited by you.

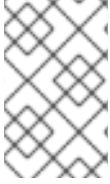
If you try to access Insights for Red Hat Enterprise Linux features and see a message that you do not have permission to perform this action, you must obtain additional permissions. The Organization Administrator or the User Access administrator for your organization configures those permissions.

Use the Red Hat Hybrid Cloud Console Virtual Assistant to ask "Contact my Organization Administrator". The assistant sends an email to the Organization Administrator on your behalf.

1.1.3. User Access roles for the Policies service

The following predefined roles on the Red Hat Hybrid Cloud Console enable access to policies features in Insights for Red Hat Enterprise Linux:

- **Policies administrator role.** The Policies administrator role provides read and write access allowing these users to perform any available operation on policies resources. This predefined role is in the **Default admin access group**.
- **Policies viewer role.** The Policies viewer role provides read-only access. (If your organization determines that the default configuration of the Policies viewer role is inadequate, a **User Access administrator** can create a custom role with the specific permissions that you need.) This predefined role is in the **Default access group**.

**NOTE**

If you configured groups before April 2023, any user who was not an Organization Administrator will have the Policies administrator role replaced with the Policies viewer role. Modifications made to the Default access group before April are not changed.

Additional Resources

- [How to use User Access](#) in the User Access Configuration Guide for Role-based Access Control (RBAC).
- [Predefined User Access roles](#)

CHAPTER 2. SETTING NOTIFICATIONS AND EMAIL PREFERENCES

By configuring notifications and user preferences settings in the Red Hat Hybrid Cloud Console, Red Hat Insights will notify you of policy changes to your Red Hat Enterprise Linux systems.

2.1. ENABLING NOTIFICATIONS AND INTEGRATIONS FOR THE POLICIES SERVICE

You can enable the notifications service on the Red Hat Hybrid Cloud Console to send notifications whenever the policy service detects an issue and generates an alert. Using the notifications service frees you from having to continually check the Red Hat Insights Dashboard for alerts.

For example, you can configure the notifications service to automatically send an email message whenever the policies service detects that a server's security software is out of date, or to send an email digest of all the alerts that the policies service generates each day.

In addition to sending email messages, you can configure the notifications service to send policies event data in other ways:

- Using an authenticated client to query Red Hat Insights APIs for event data
- Using webhooks to send events to third-party applications that accept inbound requests
- Integrating notifications with applications such as Splunk to route policies events to the application dashboard

Enabling the notifications service requires three main steps:

- First, an Organization Administrator creates a User access group with the Notifications administrator role, and then adds account members to the group.
- Next, a Notifications administrator sets up behavior groups for events in the notifications service. Behavior groups specify the delivery method for each notification. For example, a behavior group can specify whether email notifications are sent to all users, or just to Organization administrators.
- Finally, users who receive email notifications from events must set their user preferences so that they receive individual emails for each event.

Additional resources

- For more information about configuring Hybrid Cloud Console notifications to learn of identified events that have occurred and could impact your organization, see [Configuring notifications on the Red Hat Hybrid Cloud Console](#).
- For more information about configuring Hybrid Cloud Console notifications to integrate with third-party applications, see [Integrating the Red Hat Hybrid Cloud Console with third-party applications](#).

2.2. SETTING USER PREFERENCES

To receive email notifications, you can set or update your email preferences using the following procedure.

Procedure

1. Navigate to [Operations > Policies](#).
2. Click **Open user preferences** The My Notifications page appears.
3. Select **Red Hat Enterprise Linux > Policies** from the left menu.
4. Check the appropriate boxes to define your policies notification preferences.
5. Depending on your email notification preferences, you can subscribe to **Instant notification** emails for each system with triggered policies or a **Daily digest** summarizing triggered application events in a 24-hour time frame. To unsubscribe from all notifications, select **Unsubscribe from all**.



NOTE

Subscribing to instant notifications can result in receiving many emails on large inventories. To reduce the volume of emails, consider selecting the Daily digest option.

6. Click **Submit**.

CHAPTER 3. CREATING POLICIES

The following workflow examples explain how to create several types of policies that detect system configuration changes and send notification of the changes by email.



NOTE

When creating a policy, if you see a warning message that you have not opted in for email alerts, set your User preferences to receive email from your policies.

3.1. CREATING A POLICY TO ENSURE PUBLIC CLOUD PROVIDERS ARE NOT OVER PROVISIONED

Create a policy using the following procedure.

Procedure

1. In [Red Hat Hybrid Cloud Console](#), go to [Operations > Policies](#).
2. Click **Create policy**.
3. On the Create a policy page, click **From scratch** or **As a copy of existing Policy** as required. Note that the **As a copy of existing Policy** option will prompt you to select a policy from the list of existing policies to use as a starting point.
4. Click **Next**.
5. Enter **Condition**. In this case, enter: `facts.cloud_provider in ['alibaba', 'aws', 'azure', 'google'] and (facts.number_of_cpus >= 8 or facts.number_of_sockets >=2)`. This condition will detect if an instance running on the specified public cloud providers is running with CPU hardware higher than the allowed limit.



NOTE

You can expand **What condition can I define?** and/or **Review available system facts** to view an explanation of conditions you can use, and see the available system facts, respectively. In this section are examples of syntax you can use.

6. Click **Validate condition**.
7. Once the condition is validated, click **Next**.
8. On the Trigger actions page, click **Add trigger actions**. If notifications are greyed out, select **Notification settings** in the notifications box. Here you can customize notifications and their behaviors.
9. Click **Next**.



NOTE

On the Trigger actions page, you can also enable email alerts and set other available email preferences.

10. On the Review and enable page, click the toggle switch to activate the policy and review its details.
11. Click **Finish**.

Your new policy is created. When the policy is evaluated on a system check-in, if the condition in the policy is met, Policies automatically sends an email to all users on the account with access to Policies, depending on their email preferences.

3.2. CREATING A POLICY TO DETECT IF SYSTEMS ARE RUNNING AN OUTDATED VERSION OF RHEL

You can create a policy that detects if systems are running outdated versions of RHEL and notifies you by email about what it finds.

Procedure

1. In [Red Hat Hybrid Cloud Console](#), go to [Operations > Policies](#).
2. Click **Create policy**.
3. On the Create policy page, click **From scratch** or **As a copy of existing Policy** as required. Note that the **As a copy of existing Policy** option prompts you to select a policy from the list of existing policies to use as a starting point.
4. Click **Next**.
5. Enter a **Name** and **Description** for the policy.
6. Click **Next**.
7. Enter **Condition**. In this case, enter `facts.os_release < 8.1` This condition will detect if systems still run an outdated version of our operating system based on RHEL 8.1.
8. Click **Validate condition**, then click **Next**.
9. On the Trigger actions page, click **Add trigger actions** and select **Email**.
10. Click **Next**.
11. On the Review and activate page, click the toggle switch to activate the policy and review its details.
12. Click **Finish**.

Your new policy is created. When the policy is evaluated on a system check-in, if the condition in the policy is triggered, the policies service automatically sends an email to all users on the account with access to Policies, depending on their email preferences.

3.3. CREATING A POLICY TO DETECT A VULNERABLE PACKAGE VERSION BASED ON RECENT CVE

You can create a policy that detects vulnerable package versions based on recent CVE and notifies you by email about what it finds.

Procedure

1. In [Red Hat Hybrid Cloud Console](#), go to [Operations > Policies](#).
2. Click **Create policy**.
3. On the Create Policy page, click **From scratch** or **As a copy of existing Policy** as required. Note that the **As a copy of existing Policy** option will prompt you to select a policy from the list of existing policies to use as a starting point.
4. Click **Next**.
5. Enter a **Name** and **Description** for the policy.
6. Click **Next**.
7. Enter **Condition**. In this case, enter `facts.installed_packages contains ['openssh-4.5']`. This condition will detect if systems still run a vulnerable version of an **openssh** package based on recent CVE.
8. Click **Validate condition**, then click **Next**.
9. On the Trigger actions page, click **Add trigger actions** and select **Email**.
10. Click **Next**.
11. On the Review and activate page, click the toggle switch to activate the policy and review its details.
12. Click **Finish**.


Your new policy is created. When the policy is evaluated on a system check-in, if the condition in the policy is met, Policies automatically sends an email to all users on the account with access to Policies, depending on their email preferences.

CHAPTER 4. REVIEWING AND MANAGING POLICIES

You can review and manage all created policies (enabled and disabled) by navigating to [Operations > Policies](#).

You can filter the list of policies by name and by active state. You can click the options menu next to a policy to perform the following operations:

- Enable and disable
- Edit
- Duplicate
- Delete

Additionally, you can perform the following operations in bulk by selecting multiple policies from the list of policies and clicking the options menu  located next to the **Create policy** button at the top:

- Delete policies
- Enable policies
- Disable policies



NOTE

If you see a warning message about email alerts not opted in, set your User preferences to receive email from your policies.

CHAPTER 5. APPENDIX

This appendix contains the following reference materials:

- System Facts
- Operators

5.1. SYSTEM FACTS

The following table defines the system facts for use in system comparisons.

Table 5.1. System facts and their functions

Fact name	Description	Example value
Ansible	Category with a list of Ansible-related facts	controller_version with a value of 4.0.0
arch	System architecture	x86_64
bios_release_date	BIOS release date; typically MM/DD/YYYY	01/01/2011
bios_vendor	BIOS vendor name	LENOVO
bios_version	BIOS version	1.17.0
cloud_provider	Cloud vendor. Values are google, azure, aws, alibaba , or empty	google
cores_per_socket	Number of CPU cores per socket	2
cpu_flags	Category with a list of CPU flags. Each name is the CPU flag (ex: vmx), and the value is always enabled .	vmx , with a value of enabled
enabled_services	Category with a list of enabled services. Each name in the category is the service name (ex: crond), and the value is always enabled .	crond , with a value of enabled
fqdn	The fully qualified domain name (FQDN) of the system	system1.example.com
infrastructure_type	System infrastructure; common values are virtual or physical	virtual
infrastructure_vendor	Infrastructure vendor; common values are kvm, vmware, baremetal , etc.	kvm

Fact name	Description	Example value
installed_packages	List of installed RPM packages. This is a category.	bash , with a value of 4.2.46-33.el7.x86_64 .
installed_services	Category with a list of installed services. Each name in the category is the service name (ex: crond), and the value is always installed .	crond , with a value of installed .
kernel_modules	List of kernel modules. Each name in the category is the kernel module (ex: nfs), and the value is enabled .	nfs , with a value of enabled .
last_boot_time	The boot time in YYYY-MM-DDTHH:MM:SS format. Informational only; we do not compare boot times across systems.	2019-09-18T16:54:56
mssql	Category with a list of Microsoft SQL Server-related facts	mssql_version with a value of 15.0.4153.1
network_interfaces	List of facts related to network interfaces.	
	There are six facts for each interface: ipv6_addresses , ipv4_addresses , mac_address , mtu , state and type . The two address fields are comma-separated lists of IP addresses. The state field is either UP or DOWN . The type field is the interface type (ex: ether , loopback , bridge , etc.).	
	Each interface is prefixed to the fact name. For example, the interface em1 would have a mac_address system fact value of em1.mac_address .	
	Most network interface facts are compared to ensure they are equal across systems. However, ipv4_addresses , ipv6_addresses , and mac_address are checked to ensure they are different across systems. A subexception for lo must always have the same IP and MAC address on all systems.	
number_of_cpus	Total number of CPUs	1
number_of_sockets	Total number of sockets	1

Fact name	Description	Example value
os_kernel_version	Kernel version	4.18.0
os_release	Kernel release	8.1
running_processes	List of running processes. The fact name is the name of the process, and the value is the instance count.	crond , with a value of 1 .
sap_instance_number	SAP instance number	42
sap_sids	SAP system ID (SID)	A42
sap_system	Boolean field that indicates if SAP is installed on the system	True
sap_version	SAP version number	2.00.052.00.1599 235305
satellite_managed	Boolean field that indicates whether a system is registered to a Satellite Server	FALSE
selinux_current_mode	Current SELinux mode	enforcing
selinux_config_file	SELinux mode set in the config file	enforcing
systemd	The number of failures, the number of current jobs queued, and the current state of systemd	state with a value of degraded
system_memory_bytes	Total system memory in bytes	8388608
tuned_profile	Current profile resulting from the command tuned-adm active	desktop
yum_repos	List of yum repositories. The repository name is added to the beginning of the fact. Each repository has the associated facts base_url , enabled , and gpgcheck .	Red Hat Enterprise Linux 7 Server (RPMs).base_ur I would have the value https://cdn.redhat.com/content/dist/rhel/server/7/\$releasever/\$basearch/os

5.2. OPERATORS

Table 5.2. Available Operators in Conditions

Operators	Value
Logical Operators	AND
	OR
Boolean Operators	NOT
	!
	=
Numeric Compare Operators	!=
	>
	>=
	<
String Compare Operators	<=
	CONTAINS
	MATCHES
Array Operators	IN
	CONTAINS

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Procedure

To provide feedback, perform the following steps:

1. Click the following link: [Create Issue](#)
2. Describe the issue or enhancement in the **Summary** text box.
3. Provide details about the issue or requested enhancement in the **Description** text box.
4. Type your name in the **Reporter** text box.
5. Click the **Create** button.

This action creates a documentation ticket and routes it to the appropriate documentation team. Thank you for taking the time to provide feedback.