



Red Hat Insights 2020-10

Monitoring and Reacting to Configuration Changes Using Policies

How to create policies to detect system configuration changes and get notified by email

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Red Hat Customer Content Services

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Abstract

This document provides an overview of the Policies service and demonstrates how to create a policy to detect system configuration changes and get notified by email. Providing Feedback: If you have a suggestion to improve this document or find an error, submit a Bugzilla report at <http://bugzilla.redhat.com> against Cloud Software Services (cloud.redhat.com) for the Policies component.

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CHAPTER 1. OVERVIEW

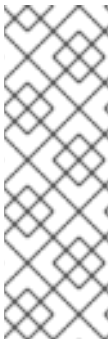
Policies evaluate system configurations in your environment and are processed on reception of uploading an insights-client payload to cloud.redhat.com. If condition(s) in your policy are met, defined action(s) are triggered. Policies are applied to all systems registered in the Insights inventory. Users can create and manage policies using the user interface or via API.

Use policies to assist operational management with simple tasks such as:


- Raising an alert when some conditions are met on system configuration.
- Emailing a team when security packages are out of date on a system.

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

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



NOTE

- Use the Role Based Access Control (RBAC) capability in <https://cloud.redhat.com> (Settings  > User access) to control user access for Policies.
- See [Role Based Access Control for Red Hat Insights and cloud management services for Red Hat Enterprise Linux](#) for more information about this feature and example use cases.

CHAPTER 2. USER PREFERENCES

Update your information and set email preferences for cloud.redhat.com services in user preferences.

1. Click the user menu located on the upper-right side, then go to **User preferences** → **Email preferences**.
2. For Policies, you can subscribe to **Instant notification** emails for each system with triggered policies and/or **Daily digest** (summary) of all systems with triggered policies depending on your email notification preference. You can also select your preference for other <https://cloud.redhat.com> emails you want to receive on this page.



NOTE

Subscribing to instant notification can result in receiving a lot of emails on large inventories, that is, one email per system checking in.

3. Click **Submit**.

CHAPTER 3. CREATING A POLICY TO DETECT CONFIGURATION CHANGES AND GET NOTIFIED BY EMAIL

The following workflow examples demonstrate how to create a policy to detect system configuration changes and get notified by email.



NOTE

If you see a warning message about email alerts not opted in when creating your policy, set your preferences to receive email from your policies as described in the [Chapter 2, User preferences](#) section.

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

1. In the cloud.redhat.com platform, click [Policies](#) under Red Hat Insights.
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.

Add Policy ✕

Policies are processed on reception of system profile messages. If condition(s) are met, defined action(s) are triggered.

1 Create Policy

2 Policy Details

3 Conditions

4 Trigger actions

5 Review and activate

Create Policy

Define a new policy:

From scratch

As a copy of existing Policy

▼ Name Filter by name 🔍

Name	Trigger actions
<input type="radio"/> Test policy that triggers every single time	✉
<input checked="" type="radio"/> Ensure public cloud providers are not over provisioned	🔗
<input type="radio"/> Ensure all systems are updated to later RHEL 8.1 release	🔗 ✉

Next Cancel

4. Click **Next**.
5. Enter a **Name** and **Description** for the policy.
6. Click **Next**.
7. 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 said public cloud providers are running with CPU hardware higher than the allowed limit.

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, and if the condition in the policy is met, an email will be sent to all users on the account with access to Policies according to their email preferences.

3.2. CREATING A POLICY TO DETECT IF SYSTEMS ARE RUNNING AN OUTDATED VERSION OF RHEL (OLDER THAN RHEL 8.1) AND GET NOTIFIED BY EMAIL

1. In the cloud.redhat.com platform, click [Policies](#) under Red Hat Insights.
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.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, and if the condition in the policy is met, an email will be sent to all users on the account with access to Policies according to their email preferences.

3.3. CREATING A POLICY TO DETECT A VULNERABLE PACKAGE VERSION BASED ON RECENT CVE AND GET NOTIFIED BY EMAIL

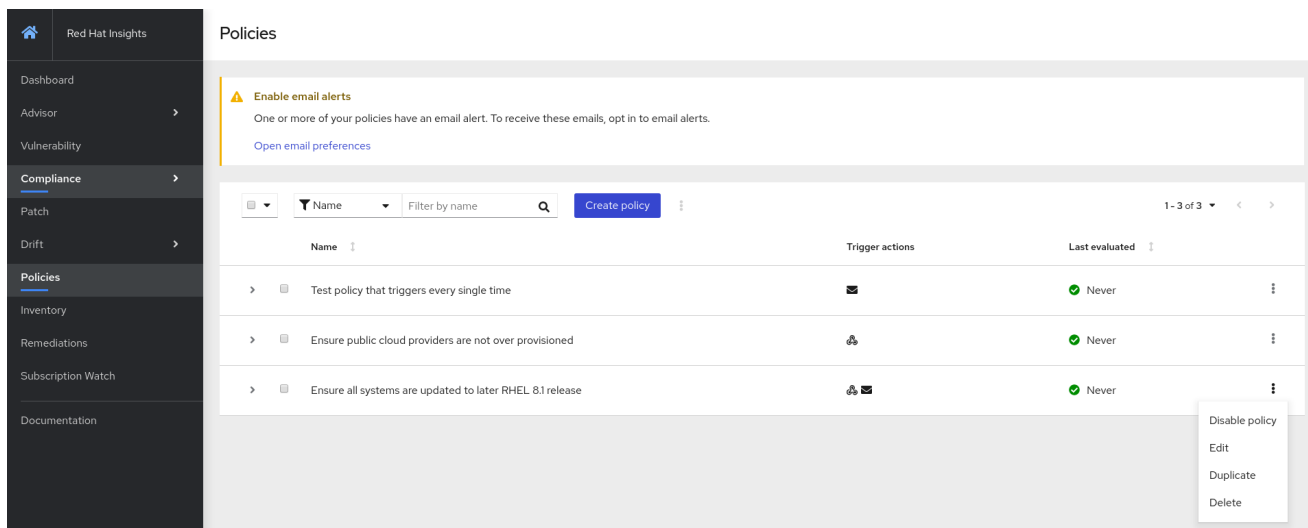
1. In the cloud.redhat.com platform, click [Policies](#) under Red Hat Insights.


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, and if the condition in the policy is met, an email will be sent to all users on the account with access to Policies according to their email preferences.


CHAPTER 4. REVIEWING AND MANAGING POLICIES

You can review and manage all created policies (enabled and disabled) by clicking [Policies](#) on the left-side menu in Red Hat Insights.



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 preferences to receive email from your policies as described in the [Chapter 2, User preferences](#) section.

CHAPTER 5. APPENDIX

This Appendix contains tables of the available system facts and their functions as well as operators.

5.1. SYSTEM FACTS

Table 5.1. System Facts and Their Functions

Fact Name	Description	Example Value
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	System Fully Qualified Domain Name	<i>system1.example.com</i>
infrastructure_type	System infrastructure; common values are virtual or physical	virtual
infrastructure_vendor	Infrastructure vendor; common values are kvm, vmware, baremetal , etc.	kvm
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 .

Fact Name	Description	Example Value
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
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 (ex: lo , em1 , etc) is prefixed to the fact name. For example, em1's mac address would be the fact named 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 should 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
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

Fact Name	Description	Example Value
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 is 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
system_memory	Total system memory in human-readable form	3.45 GiB
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_url 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	EQUAL
	NOTEQUAL
Numeric Compare Operators	GT

Operators	Value
	GTE
	LT
	LTE
String Compare Operator	CONTAINS
Array Operators	IN
	CONTAINS
Parser Operators	OR
	AND
	NOT
	EQUAL
	NOTEQUAL
	CONTAINS
	NEG