

# OS configuration management

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This page describes the OS configuration management service and guest policies.

You can use the OS configuration management service to deploy, query, and maintain consistent configurations (desired state and software) for your VM instance (VM). On Compute Engine, you must use [guest policies \(#guest-policy\)](#) to maintain consistent software configurations on a VM.

To create a guest policy, see [Create a guest policy \(/compute/docs/os-config-management/create-guest-policy\)](#).

## Guest policies

A guest policy is a resource that contains settings such as the desired package, package repository, and software configurations. The guest policy also specifies which VMs these settings should apply to.

You can use guest policies to complete the following tasks:

- Install, remove, and auto-update software packages.
- Configure software package repositories.
- Install software using [software recipes \(#key-terms\)](#).

## Key terms

- **Package:** Software packages such as dpkg or rpm.
- **Package repository:** A repository where software packages can be installed from.

- **Software recipe:** A set of instructions for installing unpackaged software for a guest operating system. With software recipes, you can specify instructions for installing software on the VMs. These instructions include additional steps such as:
  - Downloading files
  - Decompressing archives such as zip or tar
  - Running commands or scripts required to configure the software

Software recipes are ideal if you want to install software that is not delivered as a conventional software package, or for packages that require additional installation arguments or instructions.

## How guest policies work

After you set up guest policies for your project or specific VM instances and install the OS Config agent, the OS Config agent runs on your VM and uses the specifications in the guest policy to maintain the desired state for the VM. The OS Config agent applies the configurations during the agent's first run and then polls the service and corrects any drift every 10 minutes.

The OS Config agent uses the standard system package manager to apply the changes where applicable. On Linux, this means running a system package manager such as `apt install` or `yum install` for package installation.

For example you can set a policy that ensures that the [Cloud Monitoring agent](#) (`/monitoring/agent`) is installed on all instances in your project that have the prefix `test-`. For more information, see [Configuring a guest policy yml or JSON file](#) (`/compute/docs/os-config-management/create-guest-policy#create-policy-file`).

## How the configuration management service handles assignment conflicts

Because guest policies apply to existing and future running VMs, during the guest policy creation process, the service verifies that there are no current or possible future conflicts.

The configuration management service prevents conflicting configurations from being assigned to the same VMs by rejecting the latter of two policies that are deemed in conflict with each other.

For example, if you have the following policies:

- Policy A, which installs a package `foo` on all VM instances that are labeled `color=red`.
- Policy B, which removes package `foo` on all instances with a name prefix `dev-`.

Because it is possible to create an instance named `dev-instance` with a label `color=red`, then the service would have conflicting policies. To mitigate this problem, the service restricts policy B from being created.

## What's next?

- [Create a guest policy](/compute/docs/os-config-management/create-guest-policy) (/compute/docs/os-config-management/create-guest-policy).
- [Manage guest policies](/compute/docs/os-config-management/manage-guest-policy) (/compute/docs/os-config-management/manage-guest-policy).

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