

使用 `sudo` 以超级用户身份运行命令

内容

了解 `sudo` 的基本概念，以及如何以普通用户的身份使用它。

原因

某些命令需要管理员特权。要以管理员权限运行某个命令，可以使用 `sudo` 命令。

工作量

读完本文最多需要 20 分钟。如果您有具体的问题，可以直接跳转到相应章节。

目标

了解 `sudo` 的基本概念，并可以针对某些应用场景使用 `sudo` 运行命令。

要求

- `root` 或 `sudo` 特权。仅当您是系统管理员时，才拥有这些特权。有关详细信息，请参见第 1 节 “`sudo` 基本概念”。

- 需要安装 `sudo` 软件包。SUSE Linux Enterprise Server 上默认会提供该软件包。

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1 sudo 基本概念

了解 **sudo** 的基本概念及其在 SUSE Linux Enterprise Server 系统上的工作原理。

sudo 是一个 Linux 命令，用于暂时以另一用户的身份执行程序。它是 **substitute user and do** 的缩写，借用另一用户（例如 **root** 用户）的特权。这样，**sudo** 便可以帮助您完成系统管理任务，且无需以 **root** 身份登录。

1.1 Linux 系统上的 **sudo** 概述

作为 Linux 上的普通用户，您拥有的权限已被缩减，但足以完成大多数任务。**root** 用户是 Linux 超级用户，其身份相当于管理员。

sudo 允许指定的（非 **root**）用户或一组用户运行特权任务，例如以 **root** 或另一用户的身份调用系统函数。通过配置文件，系统管理员可以控制哪些用户有权针对哪些任务运行 **sudo** 命令。

1.2 SUSE Linux Enterprise Server 系统上的 **sudo**

出于安全考虑，所有 SUSE Linux Enterprise Server 系统都将普通用户与 **root** 用户区分开来。作为普通用户，您无法写入到系统目录，也无法安装程序。任何有权访问 **root** 口令的用户都可以获取相关特权，然后可能意外或恶意地破坏系统。

例如，您以普通用户身份登录，并意外地浏览到某个恶意网站。攻击者无法偷偷地在您的系统上安装恶意软件，因为您是以普通用户身份登录的，这意味着您不拥有任何管理权限。

如前所述，出于安全原因，不建议一直以 **root** 用户身份登录。较为安全的做法是始终以普通用户身份登录，并运行以 **sudo** 开头的受限命令。



注意：**sudo** 需要管理员权限

在您设置了自己的 **root** 口令的单用户计算机上，您拥有使用 **sudo** 命令管理系统以及自行配置 **sudo** 设置所需的权限。

有关如何配置 **sudo** 的详细信息，请访问 <https://documentation.suse.com/smart/systems-management/html/sudo-configure-superuser-privileges/index.html>。

在多用户环境中（例如在公司中），**sudo** 特权由系统管理员管理，并且可以限制 **root** 用户的权限。即使使用 **sudo** 执行命令，您可能也无法更改某些系统目录或文件。

1.3 **sudo** 的工作原理

运行以 **sudo** 开头的命令时，系统会要求您输入 **root** 帐户的口令。成功完成身份验证后，将以超级用户特权执行该命令。

根据 **sudo** 配置，提升的特权会保留特定的一段时间，直到您在同一终端会话中的操作结束为止。如此，在运行另一个 **sudo** 命令时，您无需再次提供口令。

要使用 **sudo** 运行命令，请使用以下语法：

```
> sudo [command]
```

2 运行以 **sudo** 开头的命令

作为普通的用户，您可以在命令前加上 **sudo** 来以 **root** 身份运行任何命令。系统会提示您提供 **root** 口令。如果成功完成身份验证，便会以 **root** 身份运行命令。

运行以 **sudo** 开头的命令时，系统会要求您输入 **root** 帐户的口令。成功完成身份验证后，将以超级用户特权执行该命令。

根据 **sudo** 配置，提升的特权会保留特定的一段时间，直到您在同一终端会话中的操作结束为止。如此，在运行另一个 **sudo** 命令时，您无需再次提供口令。

过程 1：运行以 **sudo** 开头的命令

以下过程说明如何使用 **sudo** 命令将文件复制到只有 **root** 用户有权编辑的目录。

1. 打开终端并使用以下命令创建测试文件：

```
> touch test.txt
```

2. 尝试使用以下命令将文件复制到 `/usr/local/bin/` 目录中：

```
> cp test.txt /usr/local/bin
```

终端会返回类似如下的消息：

```
cp: cannot create regular file '/usr/local/bin/test.txt': Permission denied
```

如果未向 `sudo` 授予所需的特权，则也会出现此消息。

3. 现在，输入以 `sudo` 开头的同一命令：

```
> sudo cp test.txt /usr/local/bin
```

4. 系统会提示您输入 `root` 口令。请注意，在输入过程中既不会显示明文口令，也不会显示屏蔽字符形式的口令。

```
[sudo] password for root:
```

5. 成功完成身份验证后，测试文件将复制到 `/usr/local/bin/`。

您已运行第一个 `sudo` 命令。

3 常见 `sudo` 命令

在任一命令的前面加上 `sudo`，可以使用提升的权限运行该命令。您还能以另一用户的身份运行命令，并使用该用户的环境变量。

本章提供通常需要管理特权的常见命令的示例。

使用 `sudo` 重复上一个命令

要以管理员身份重复上一个命令，请运行 `sudo !!` 并输入口令。例如，没有管理特权的用户无法在 `/etc/` 目录下创建目录。要创建目录，请运行 `sudo !!`。

```
> mkdir /etc/test/  
mkdir: cannot create directory '/etc/test/': Permission denied
```

```
> sudo !!
sudo mkdir /etc/test/
[sudo] password for root:

> ls -alrt /etc | grep test
drwxr-xr-x 1 root root          0 Apr 20 12:48 test
```

使用 `sudo` 和 `zypper` 管理软件包

要以管理员身份运行软件包管理命令，请在该命令的前面加上 `sudo`：

```
> sudo zypper [--GLOBAL-OPTIONS] <COMMAND> [--COMMAND-OPTIONS] [ARGUMENTS]
```

例如，要从官方软件包储存库安装 Docker CE 容器化平台，请使用 `sudo` 运行以下命令：

```
> sudo zypper addrepo https://download.docker.com/linux/suse/docker-
ce> sudo zypper refresh> sudo zypper search docker-ce> sudo zypper install
docker-ce
```

对于不会修改系统的 `zypper` 命令，您无需在其前面加上 `sudo`；此外，无需提供对信息的访问特权。例如，无需使用 `sudo` 即可列出系统上已安装软件包的储存库：

```
> zypper lr
```

使用 `sudo` 和 `systemctl` 管理系统服务

在使用 `systemd` 管理服务的系统中，您可以将 `systemctl` 命令与 `sudo` 结合使用。例如，要重启 NetworkManager 服务，请运行：

```
> sudo systemctl restart NetworkManager
```

对于不会修改系统的 `systemctl` 命令，您无需在其前面加上 `sudo`；此外，无需提供对信息的访问特权。例如，无需使用 `sudo` 即可显示网络管理器的状态：

```
> systemctl status NetworkManager
● NetworkManager.service - Network Manager
   Loaded: loaded (/usr/lib/systemd/system/NetworkManager.service;
   enabled; vendor preset: disabled)
   Drop-In: /usr/lib/systemd/system/NetworkManager.service.d
            └─NetworkManager-ovs.conf
   Active: active (running) since DAY YYYY-MM-DD HH:MM:SS TIMEZONE; 1h
   21min ago
```

```
Docs: man:NetworkManager(8)
[...]
```

使用 `sudo` 和 `usermod` 修改用户帐户

要运行 `usermod` 命令来修改用户帐户，请使用：

```
> sudo usermod [OPTION] USERNAME
```

例如，要将口令失效后永久禁用用户帐户 `tux` 的天数设置为 `30`，请运行：

```
> sudo usermod --inactive 30 tux
```

使用 `sudo` 和 `chown` 修改文件和目录所有权

要将文件和目录所有权从当前所有者更改为新所有者，请使用：

```
> sudo chown [OPTION] [OWNER:[GROUP]] FILE
```

例如，要向 `tux` 授予 `/home/test/tux-files` 目录中各文件和子目录的所有权，请运行：

```
> sudo chown tux /home/test/tux-files/ --recursive
```

可以运行以下命令来测试所有权更改：

```
> ls -alrt /home/test/tux-files/ --recursive
```

以另一用户的身份使用 `sudo -s` 运行命令

您无需使用 `su` 命令切换到另一用户，然后再运行命令，而是可以直接使用 `sudo -s` 命令。`sudo -s` 命令运行的外壳继承当前用户的环境。`sudo -s` 命令还提供了一些特权控制措施。

要以另一用户的身份运行命令，请使用：

```
> sudo -s -u USERNAME COMMAND
```

默认情况下，该命令从前一用户的目录运行，因为目标用户会继承前一用户的环境。

例如，要以目标用户 `tux` 的身份以递归方式列出 `/home/test/tux-files/` 目录的文件和子目录，请运行：

```
> sudo -s -u tux ls -alrt /home/test/tux-files/ --recursive
```

当您以另一用户的身份使用 `sudo -s` 方法运行某个命令时，该命令将记录到您的历史中。

以另一用户的身份使用 `sudo -i` 在干净的环境中运行命令

使用 `sudo -s` 命令时，目标用户将继承前一用户的环境。您可以使用 `sudo -i` 命令来防止出现这种情况，运行此命令后，目标用户将获得一个干净的环境，并可以在他们自己的 `$HOME` 目录开始工作。

要以另一用户的身份在干净的环境中运行命令，请使用：

```
> sudo -i -u USERNAME COMMAND
```

`sudo -i` 命令将外壳作为目标用户的交互式登录外壳运行。因此，我们开发了一些外壳启动脚本，例如 `.profile` 和 `.bash_profile` 文件。

例如，要以 `tux` 身份列出 `/home/test/tux-files/` 目录的文件和子目录，请运行以下命令：

```
> sudo -i -u tux ls -alrt /home/test/tux-files/
```

当您以另一用户的身份使用 `sudo -i` 方法运行某个命令时，该命令将记录到您的历史中。

4 `sudo` 与 `su` 的区别

了解 `sudo` 和 `su` 命令的区别及其使用时机。

在 Linux 系统上，您可以在命令的前面加上 `sudo` 或 `su`。这两种形式都允许您以 `root` 身份执行命令。

4.1 `sudo` 命令的特征

- `sudo` 允许您以 `root` 身份运行命令。根据配置，它不要求您输入 `root` 口令，而只需输入用户的口令。这样，就不需要与所有其他（普通）用户共享敏感信息。
- 使用 `sudo` 配置文件，系统管理员可以控制允许哪些用户使用 `sudo` 并仅限将其用于特定的任务。

- **sudo** 将口令缓存特定的一段时间。在此期限之后，当您运行另一个 **sudo** 命令时，系统会再次提示您输入口令。
- 所有使用 **sudo** 执行的命令会单独记录。日志文件会跟踪日期和时间、运行命令的用户以及命令本身。

4.2 su 命令的特征

- **su** 允许您以 **root** 身份运行命令，但您必须知道 **root** 口令。
- 无法将它配置为仅限特定的用户访问或仅限用于特定的任务，以及提升知道 **root** 口令的任何用户的特权。
- 将提升用于整个终端会话的特权。只要您不退出会话，系统就不会再次提示您输入口令。
- 使用 **su** 执行的命令不会单独记录，因为只能使用用户帐户记录所有操作。

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