Red Hat Enterprise Linux 8

Using the desktop environment in RHEL 8

Configuring and customizing the GNOME 3 desktop environment on RHEL 8

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Legal Notice

Abstract

This document describes how to customize and use GNOME 3, which is the only desktop environment available in RHEL 8. The basics of using GNOME Shell and displaying the graphics are given, as well as the instructions for system administrators for configuring GNOME on a low level and customizing the desktop environment for multiple users. The documentation also describes how to handle selected system administration tasks using the desktop environment.

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CHAPTER 1. STARTING USING GNOME

1.1. WHAT GNOME 3 IS

Red Hat Enterprise Linux 8 is shipped with the default desktop environment GNOME 3.

GNOME 3 represents a presentation layer that provides a graphical user interface as well as the focused working environment, which enables you to access all your work from one place.

1.2. GNOME ENVIRONMENTS

GNOME 3 provides two essential environments:

- GNOME Standard
- GNOME Classic

Both environments can use two different protocols to build a graphical user interface:

- The **X11** protocol, which uses **X.Org** as the display server.
- The **Wayland** protocol, which uses **GNOME Shell** as the **Wayland** compositor and display server.
  This solution of display server is further referred as **GNOME Shell on Wayland**

NOTE

Note that the graphics based on the **Wayland** protocol are not available for virtual machines that use the **qxl** driver.

You can find the current list of environments for which Wayland-based graphics are unavailable in the **/usr/lib/udev/rules.d/61-gdm.rules** file.

The default combination in Red Hat Enterprise Linux 8 is GNOME Standard environment using **GNOME Shell on Wayland** as the display server.

However, due to Section 2.2, “Current Wayland limitations” , you may want to switch the graphics protocol stack.

You may also want to swich from GNOME Standard to GNOME Classic.

For more information about graphics based on the **Wayland** protocol, see Section 2.1, “Key differences between the Wayland and X11 protocol”.

For information on how to switch the environments, see Selecting GNOME environment.

1.2.1. GNOME Standard

GNOME Standard user interface includes these major components:

- **Top bar**
  The horizontal bar at the top of the screen provides access to some of the basic functions of GNOME Standard, such as the **Activities Overview**, clock and calendar, system status icons, and the **system menu**.

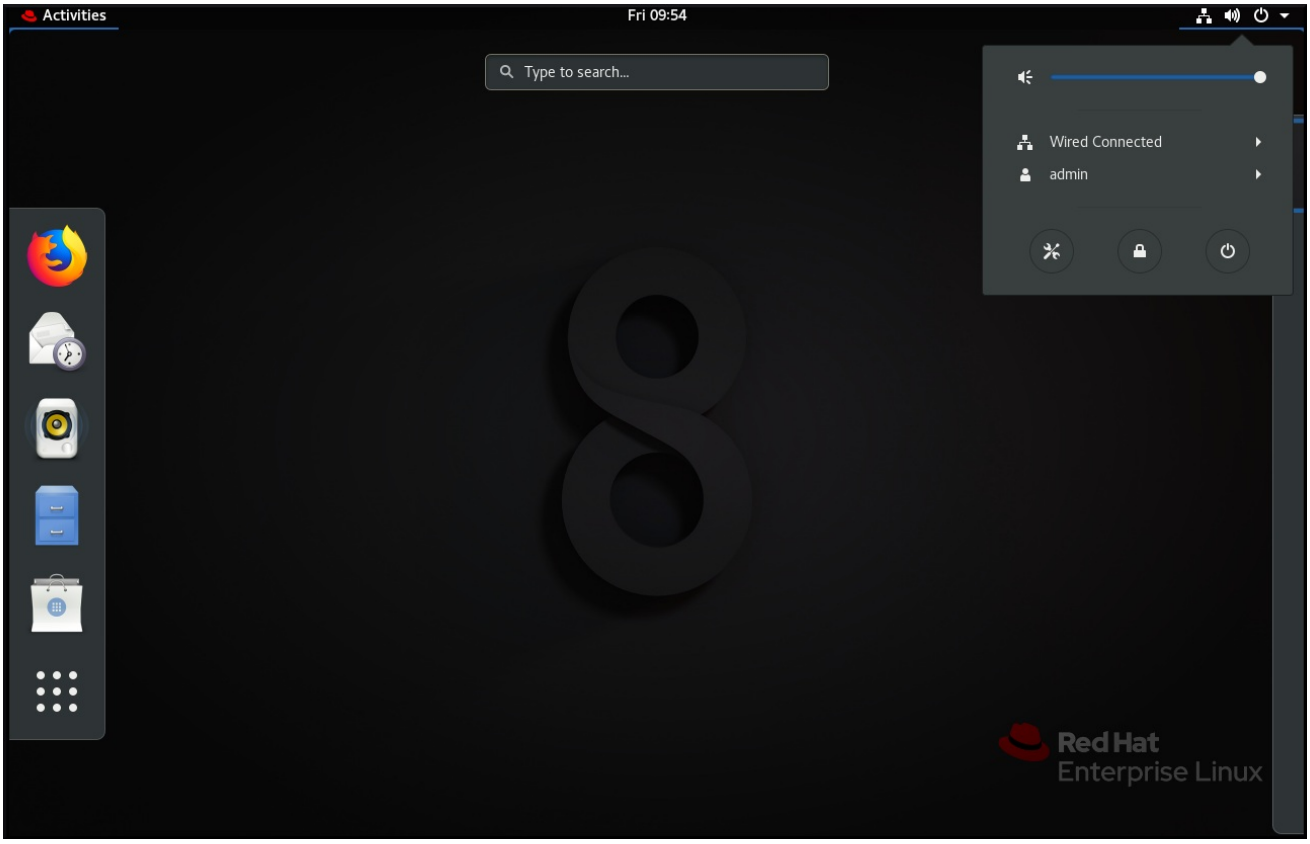
- **System menu**
  The **system menu** is located in the top right corner, and enables you:
  - Updating settings
  - Controlling the sound bar
  - Finding information about your Wi-Fi connection
  - Switching user
  - Logging out
  - Turning off the computer
- **Activities Overview**
  The **Activities Overview** features windows and applications views that let the user run applications and windows and switch between them.

  The **search entry** at the top allows for searching various items available on the desktop, including applications, documents, files, and configuration tools.

  The vertical bar on the left side contains a list of favorite and running applications. You can add or remove applications from the default list of favorites according to your needs.

  The workspace list displayed on the right side allows the user to switch between multiple workspaces, or move applications and windows from one workspace to another.
- **Message tray**
  The **message tray** provides access to pending notifications. The **message tray** shows when the user presses **Super+M**.

The GNOME 3 Standard Desktop



1.2.2. GNOME Classic

GNOME Classic represents a mode for users who prefer a more traditional desktop experience that is similar to GNOME 2 environment used with Red Hat Enterprise Linux 6. It is based on GNOME 3 technologies, and at the same time it includes multiple features similar to GNOME 2.

GNOME Classic user interface consists of these major components:

- **Applications and Places**
  The **Applications** menu is displayed at the top left of the screen. It gives the user access to applications organized into categories. If you enable window overview, you can also open the **Activities Overview** from that menu.

  The **Places** menu is displayed next to the **Applications** menu on the top bar. It gives the user quick access to important folders, for example **Downloads** or **Pictures**.

- **Taskbar**
  The **taskbar** is displayed at the bottom of the screen, and features:

  - A window list
  - A notification icon displayed next to the window list
  - A short identifier for the current workspace and total number of available workspaces displayed next to the notification icon

- Four available workspaces
  In GNOME Classic, the number of workspaces available to the user is by default set to 4.

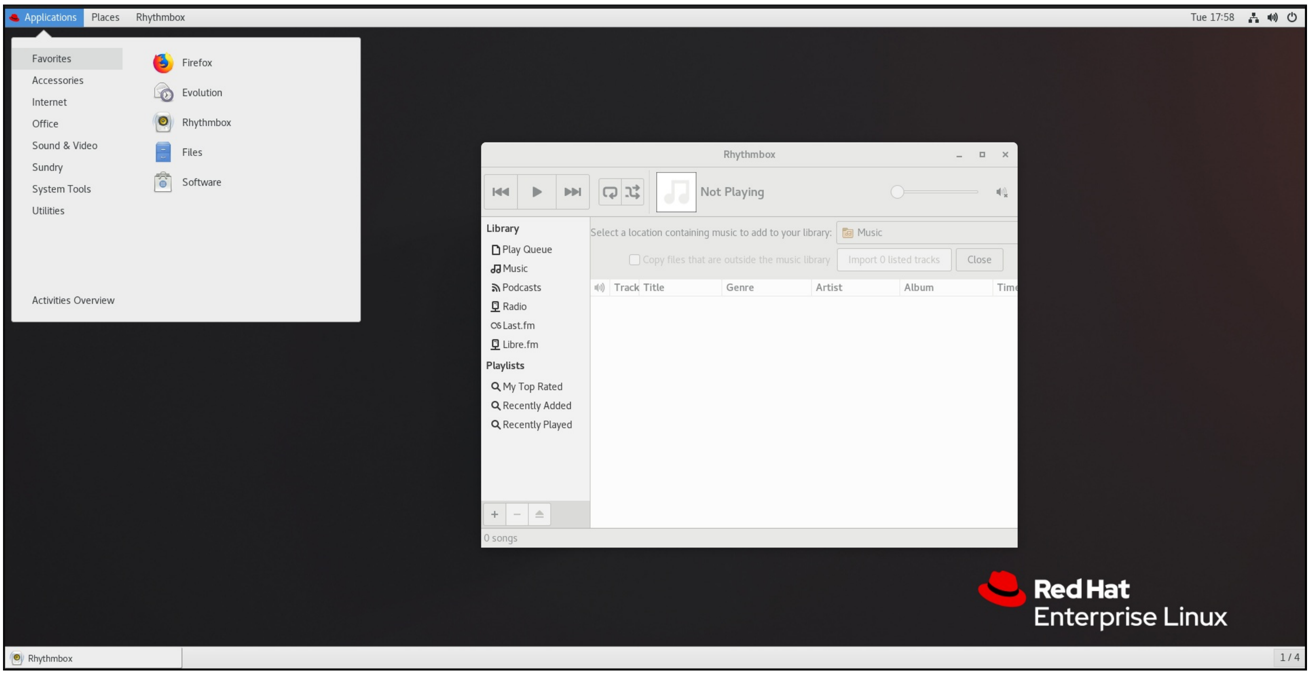
- Minimize and maximize buttons
  Window titlebars in GNOME Classic feature the minimize and maximize buttons that let the user quickly minimize the windows to the window list, or maximize them to take up all of the space on the desktop.

- A traditional **Super+Tab** window switcher
  In GNOME Classic, windows in the **Super+Tab** window switcher are not grouped by application.

- **System menu**
  The **system menu** is located in the top right corner, and enables you:

  - Updating settings
  - Controlling the sound bar
  - Finding information about your Wi-Fi connection
  - Switching user
  - Logging out
  - Turning off the computer

The GNOME 3 Classic Desktop with the Rhythmbox application and the Favorites submenu of the Applications menu



In GNOME Classic, the overview of windows that are open is not available by default. You can see the list of all open windows in the **taskbar** at the bottom of the screen. However, you can enable the windows overview similar to what is by default available in GNOME Standard by changing the default settings of the GNOME Classic environment as described in Section 1.2.3, “Enabling window overview in GNOME Classic”.

1.2.3. Enabling window overview in GNOME Classic

In GNOME Classic, the overview of open windows is not available by default. This procedure enables the window overview for all users on the system.

IMPORTANT

Enabling the window overview by this procedure is not a permanent change. Each update of the **gnome-classic-session** package overwrites the configuration file to the default settings, which disable the window overview.

To keep the window overview enabled, apply the procedure after each update of **gnome-classic-session**.

Procedure

1. Open the **/usr/share/gnome-shell/modes/classic.json** file as the **root** user.

2. Find the following line in the file:

   ```
   "hasOverview": false
   ```

3. Change the line to the following:

   ```
   "hasOverview": true
   ```

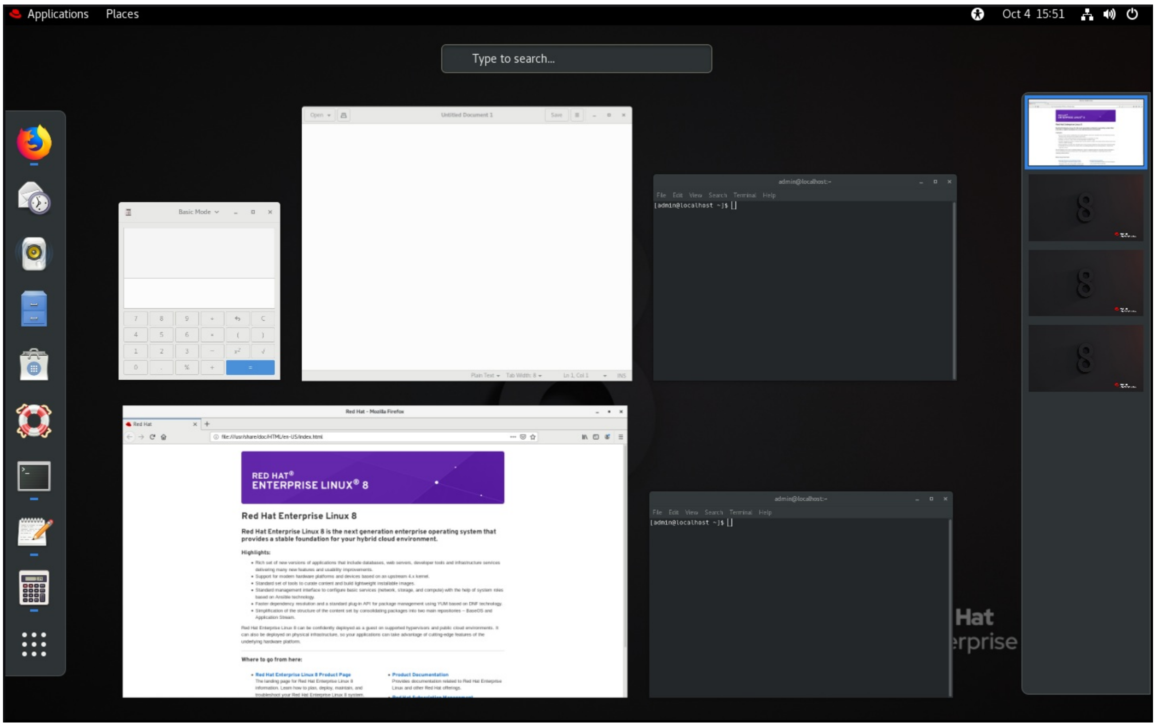
4. Save changes, and close the **/usr/share/gnome-shell/modes/classic.json** file.

5. Restart the user session.

Verification steps

1. In your GNOME Classic session, open multiple windows.
2. Press the **Super** key to open the window overview.
3. In the overview, check that:
   - The **Dash** (the vertical panel on the left side of the screen) is displayed.
   - The bottom panel is not displayed.
   - The workspace switcher is displayed on the right side of the screen.

Window overview with "hasOverview": true


Applications
Places
Oct 4 15:51
Type to search...
Untitled Document 1
Basic Mode
admin@localhost:~
File Edit View Search Terminal Help
Red Hat - Mozilla Firefox
RED HAT® ENTERPRISE LINUX® 8
Red Hat Enterprise Linux 8

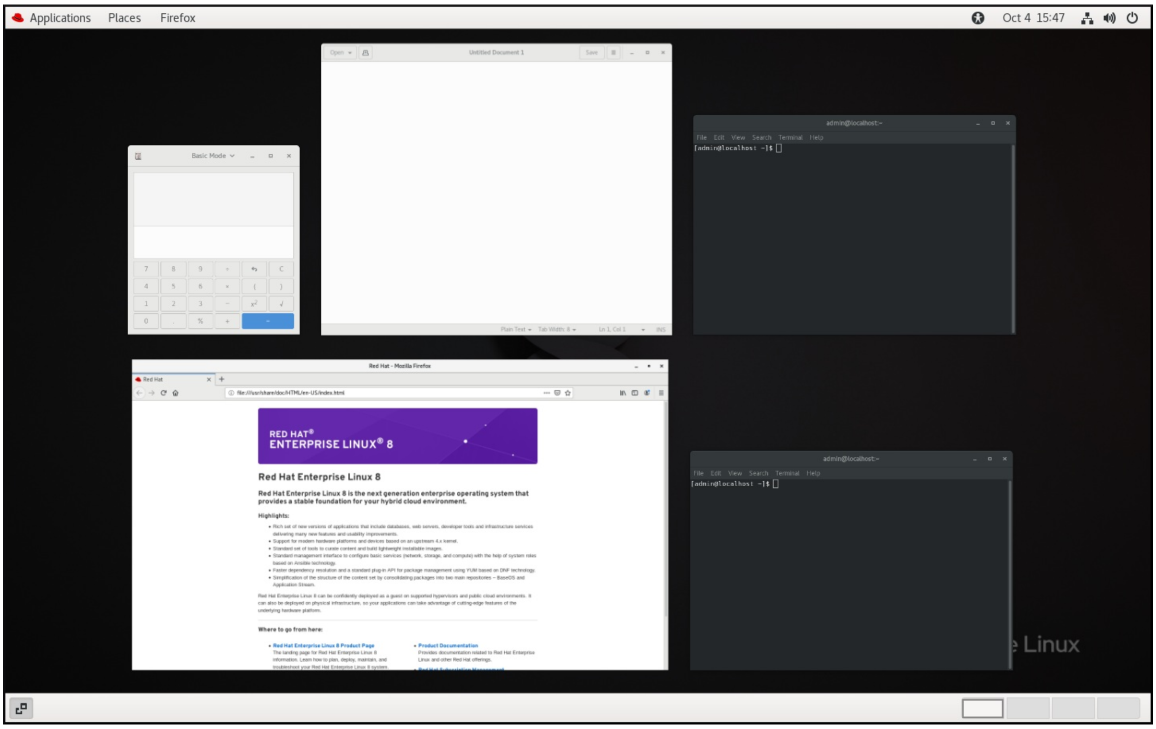
```
[admin@localhost ~]$ 
```

```
[admin@localhost ~]$ 
```

With the default settings (**"hasOverview": false**), the overview has the following features:

- The **Dash** is not displayed.
- The bottom panel is displayed. It includes the **Window picker** button in its left part and the workspace switcher in its right part.

Window overview with "hasOverview": false



```
[admin@localhost ~]$
```

1.3. DISABLING THE HOT CORNER FUNCTIONALITY ON GNOME SHELL

The GNOME environment provides the hot corner functionality, which is enabled by default. This means that when you move the cursor to the area of the top left corner and press the cursor in this area, the **Activities Overview** menu opens automatically.

However, you may want to disable this feature to not open **Activities Overview** unintentionally.

To do so, you can use the following tools:

- The **dconf Editor** application
- The **gsettings** command-line utility
- The **No topleft hot corner** extension

The selection of the tool might depend on whether you want to disable the hot corner functionality for a single user or for all users on the system. By using **dconf Editor** or **gsettings**, you can disable hot corner only for a single user. To disable hor corner system-wide, use the **No topleft hot corner** extension.

1.3.1. Disabling the hot corner functionality for a single user

To disable the hot corner functionality for a single user, you can use either the **dconf Editor** application or the **gsettings** command-line utility.

1.3.1.1. Disabling hot corner using dconf Editor

To disable the hot corner functionality using the **dconf Editor** application, follow this procedure.

Prerequisites

- The **dconf Editor** application is installed on the system:

```
# yum install dconf-editor
```

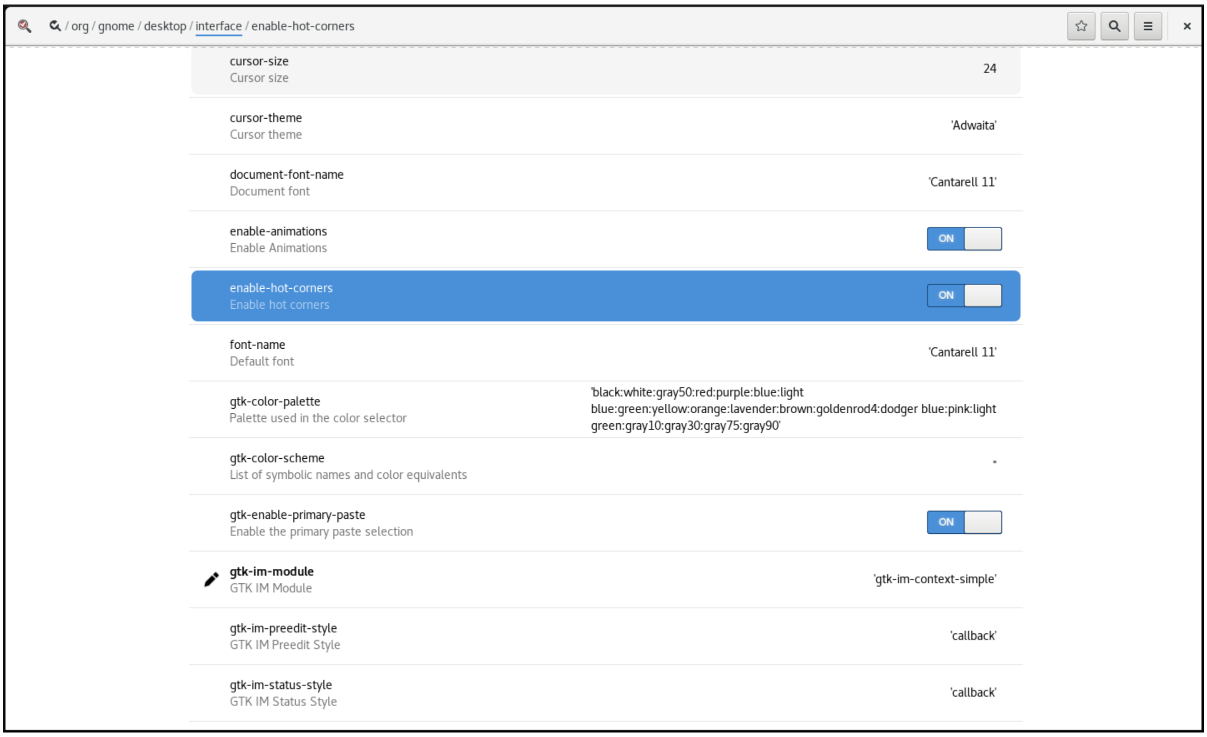
Procedure

1. Open the **dconf Editor** application.

2. Choose the **org.gnome.desktop.interface** menu.

3. Find the **enable-hot-corners** option.
   This option is by default set to **On**.

   Default settings of enable-hot-corners

   / org / gnome / desktop / interface / enable-hot-corners

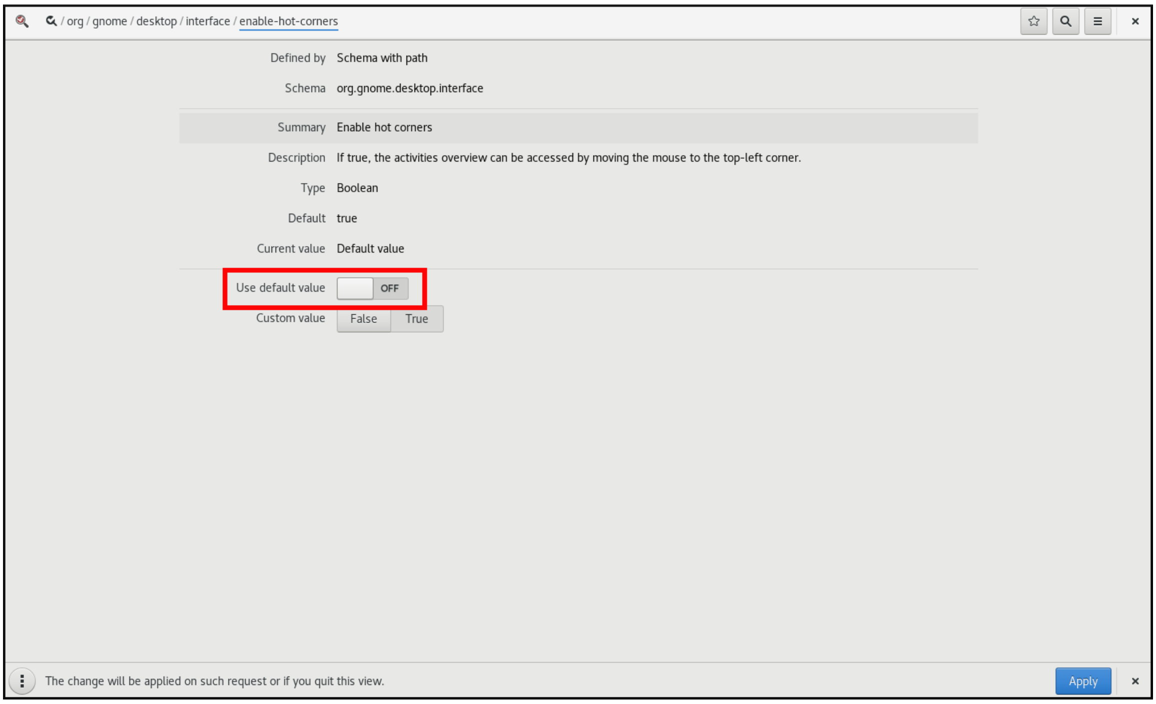
cursor-size Cursor size	24
cursor-theme Cursor theme	'Adwaita'
document-font-name Document font	'Cantarell 11'
enable-animations Enable Animations	ON
enable-hot-corners Enable hot corners	ON
font-name Default font	'Cantarell 11'
gtk-color-palette Palette used in the color selector	'black:white:gray50:red:purple:blue:light blue:green:yellow:orange:lavender:brown:goldenrod4:dodger blue:pink:light green:gray10:gray30:gray75:gray90'
gtk-color-scheme List of symbolic names and color equivalents	''
gtk-enable-primary-paste Enable the primary paste selection	ON
gtk-im-module GTK IM Module	'gtk-im-context-simple'
gtk-im-preedit-style GTK IM Preedit Style	'callback'
gtk-im-status-style GTK IM Status Style	'callback'

4. Set **enable-hot-corners** to **False**.
   You can do this either by:

   - Setting **enable-hot-corners** to **Off** in the same window.

   - Clicking the line with **enable-hot-corners**, and proceeding to a new window.
     In the new window, you can switch the hot corner feature off.

     Switching the hot corner functionality off



/ org / gnome / desktop / interface / enable-hot-corners

Defined by Schema with path

Schema org.gnome.desktop.interface

Summary Enable hot corners

Description If true, the activities overview can be accessed by moving the mouse to the top-left corner.

Type Boolean

Default true

Current value Default value

Use default value OFF

Custom value False True

The change will be applied on such request or if you quit this view.

For more information on **dconf Editor** application, see Section 4.3, “Displaying GSettings values for desktop applications”.

1.3.1.2. Disabling hot corner using gsettings

To disable the hot corner functionality using the **gsettings** command-line utility, follow this procedure.

Procedure

- Enter the following command to disable the hot corner feature:

```
$ gsettings set org.gnome.desktop.interface enable-hot-corners false
```

Verification steps

- Optionally, verify that the hot corner feature is disabled:

```
$ gsettings get org.gnome.desktop.interface enable-hot-corners
false
```

1.3.2. Disabling the hot corner functionality for all users

With the GNOME Shell extension called **No topleft hot corner** provided by the **gnome-shell-extension-no-hot-corner** package, you can disable the hot corner feature system-wide.

Prerequisites

- The **gnome-shell-extension-no-hot-corner** package is installed on the system:

```
# yum install gnome-shell-extension-no-hot-corner
```

Procedure

1. Enable the **No topleft hot corner** extension by switching it on in the **Tweaks** tool.
   For more information on how to use **Tweaks**, see Section 1.12, “Customizing GNOME Shell environment with the Tweaks tool”.

2. Log out, and restart the user session so that the extension can take effect.

1.4. SELECTING GNOME ENVIRONMENT AND DISPLAY PROTOCOL

The default desktop environment for Red Hat Enterprise Linux 8 is GNOME Standard with **GNOME Shell on Wayland** as the display server.

However, due to Section 2.2, “Current Wayland limitations” , you may want to switch the graphics protocol stack.

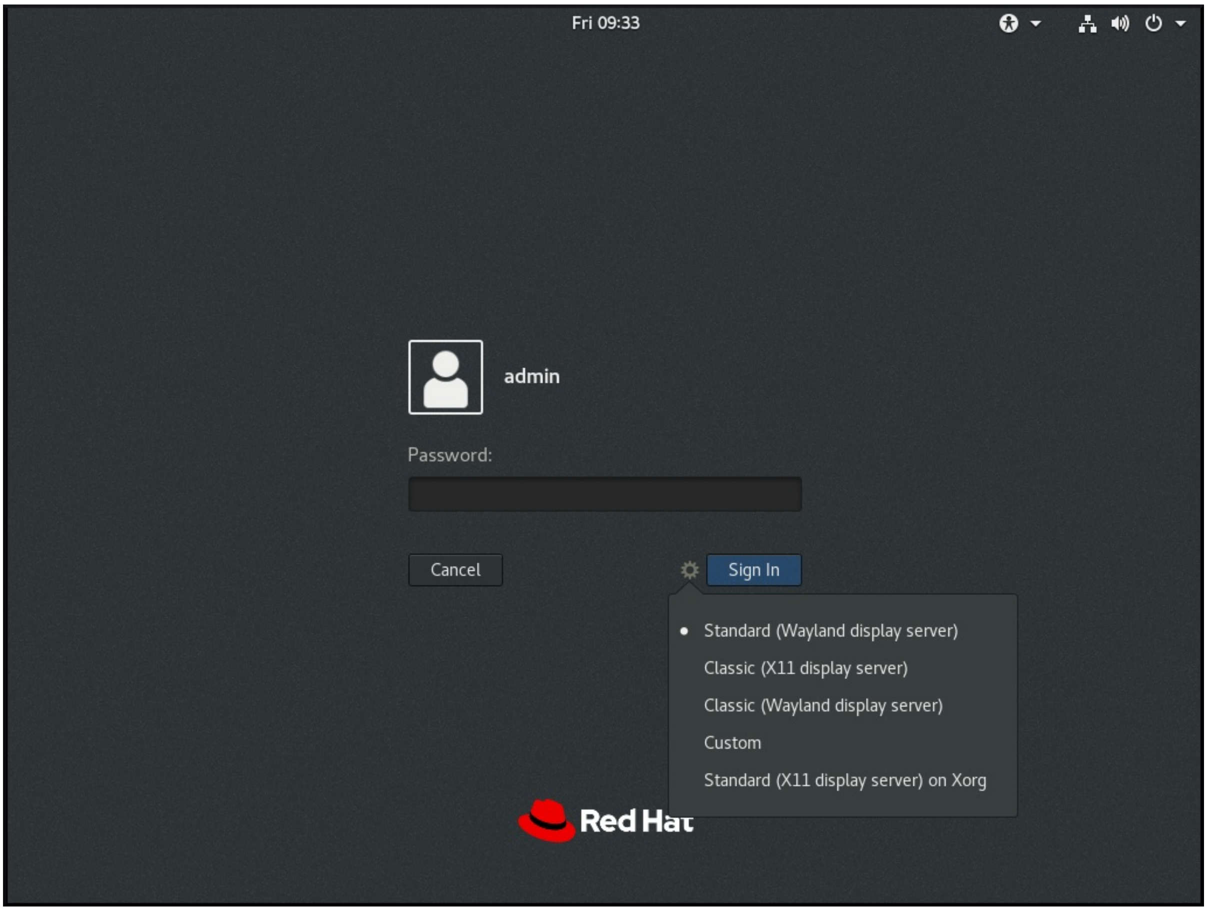
You may also want to swich from GNOME Standard to GNOME Classic. See Section 1.2, “GNOME environments” for differences between these two environments.

For switching between various combinations of GNOME environment and graphics protocol stacks, use the following procedure.

Procedure

1. From the login screen (GDM), click the cogwheel next to the **Sign In** button.

> NOTE
>
> You cannot access this option from the lock screen. The login screen appears when you first start Red Hat Enterprise Linux 8 or when you log out of your current session.


Fri 09:33
admin
Password:
Cancel
Sign In
● Standard (Wayland display server)
Classic (X11 display server)
Classic (Wayland display server)
Custom
Standard (X11 display server) on Xorg
Red Hat

2. From the drop-down menu that appears, select the option that you prefer.

NOTE

Note that in the menu that appears on the login screen, the **X.Org** display server is marked as **X11** display server.

IMPORTANT

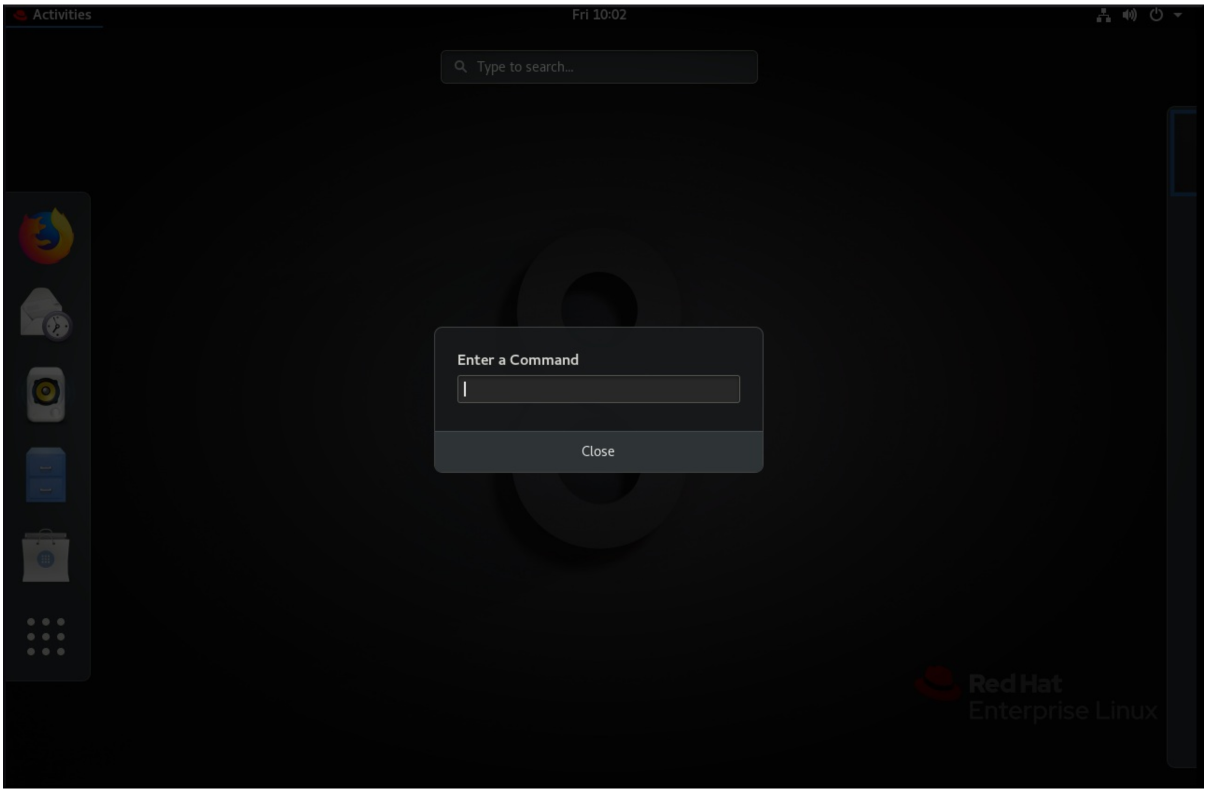
The change of GNOME environment and graphics protocol stack resulting from the above procedure is persistent across user logouts, and also when powering off or rebooting the computer.

1.5. LAUNCHING APPLICATIONS

This section describes various approaches that you can use to launch available applications in GNOME 3.

Procedure

1. Press **Alt+F2** to make the **Enter a Command** screen appear.
2. Write the name of the executable into the **Enter a Command** screen:

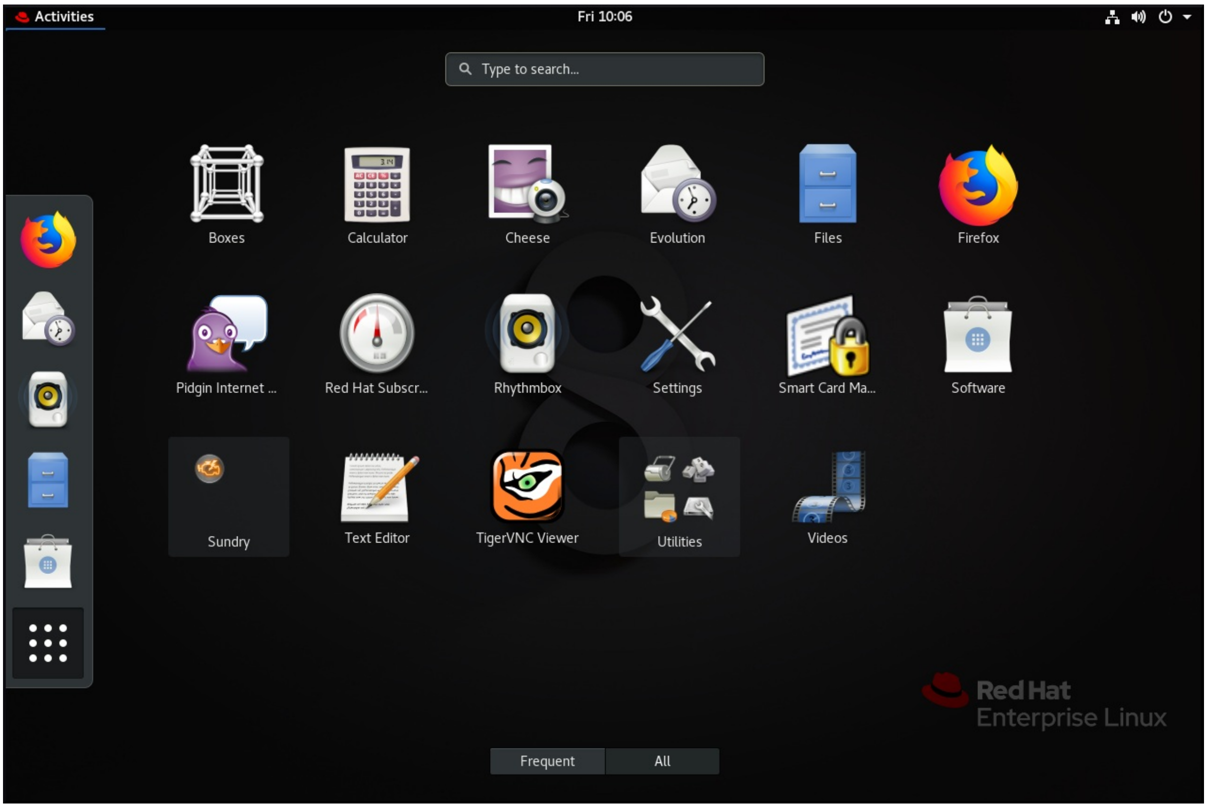


This approach works both in GNOME Standard and GNOME Classic environment.

Procedure

- In GNOME Standard, go to **Activities Overview** and click on the **Show Applications** icon in the vertical bar on the left side.
  Note that you can choose between displaying all or just the frequent applications by using the **Frequent**/**All** switch at the bottom of the screen.

  Alternatively, you can also start typing the name of the required application in the **search entry**.



Procedure

1. In GNOME Classic, go to **Applications** menu.
2. Choose the required application from one of the available categories.
   The available categories include:
   - Favorites
   - Accessories
   - Internet
   - Office
   - Sound & Video
   - Sundry
   - System Tools
   - Utilities

Procedure

1. Open a terminal.
2. Type the name of the required application on the command line.

This approach works both in GNOME Standard and GNOME Classic environment.

1.6. INSTALLING APPLICATIONS

This section describes various approaches that you can use to install a new application in GNOME 3.

Procedure

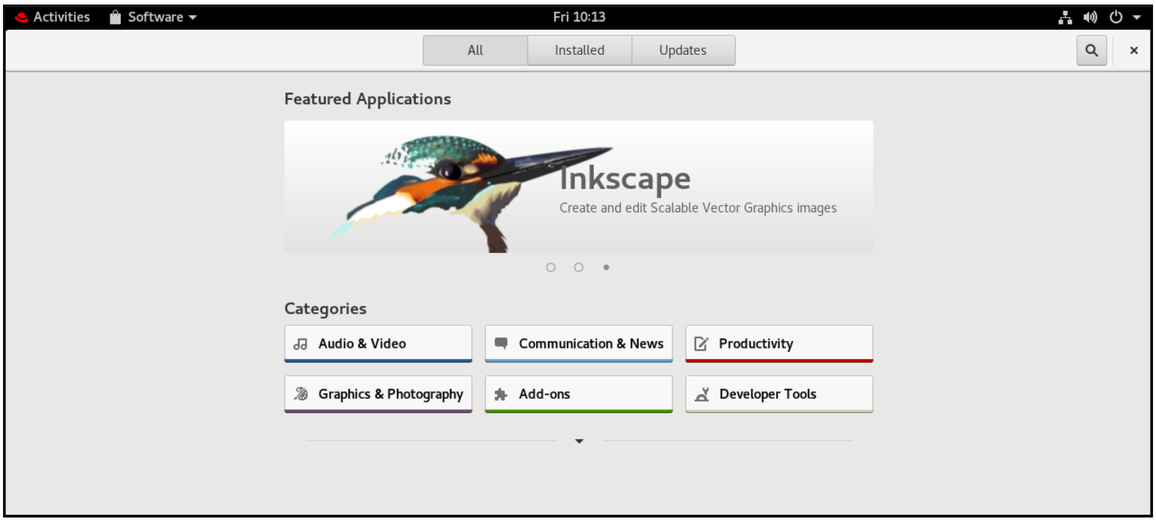
1. Use one of the approaches described in Launching applications to launch GNOME Software.

   NOTE

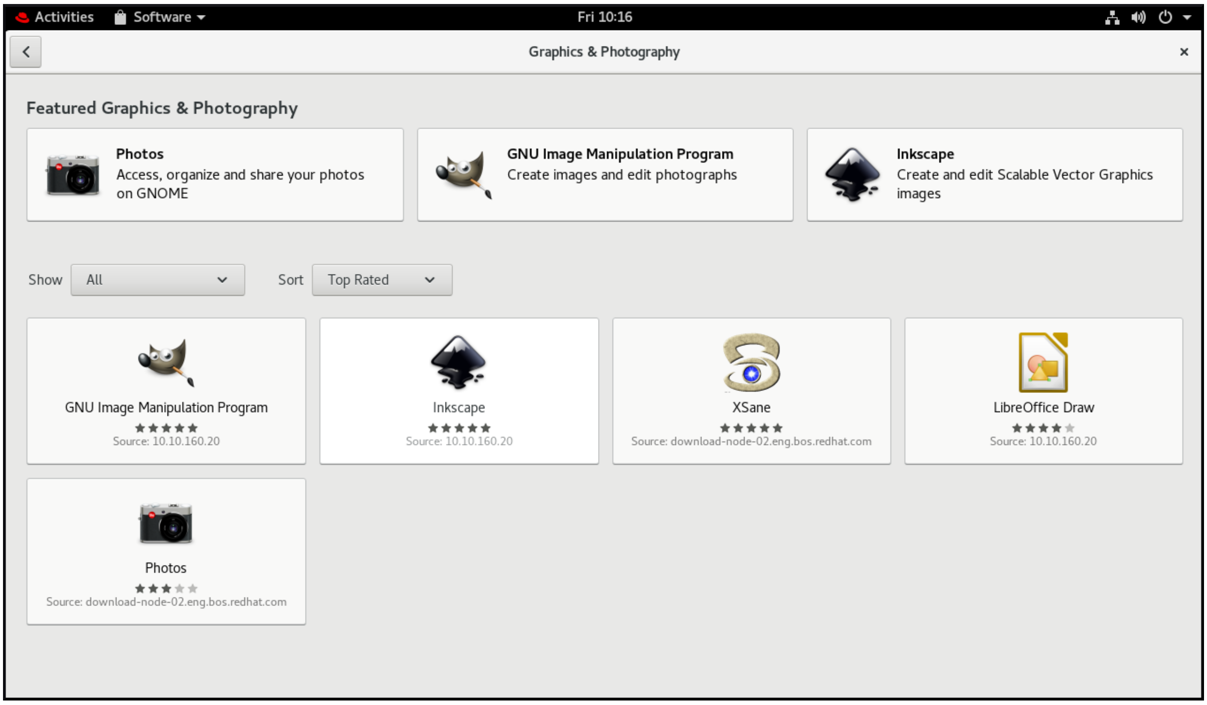
   GNOME Software is a utility, which enables you to install and update applications and gnome-shell extensions through a graphical environment. This utility is based on the PackageKit technology, which serves as its back end. GNOME Software offers mainly the desktop applications, which are the applications that include the ***.desktop** file. The available applications are grouped into multiple categories according to their purpose.

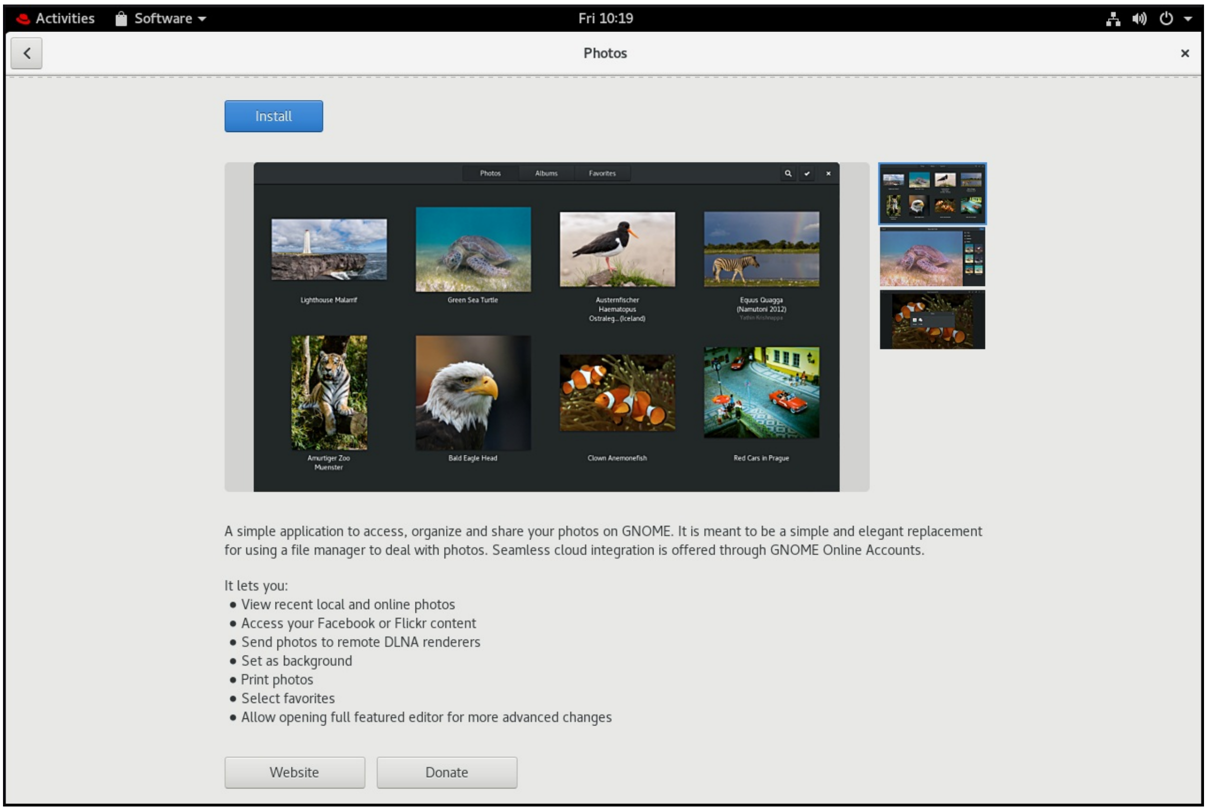
2. Choose the application to be installed from one of the available categories.
   - Audio & Video
   - Communication & News
   - Productivity

- Graphics & Photography
- Add-ons
- Developer Tools
- Utilities



3. Click the selected application, and then click the **Install** button.


Activities
Software
Fri 10:16
Graphics & Photography
Featured Graphics & Photography
Photos
Access, organize and share your photos on GNOME
GNU Image Manipulation Program
Create images and edit photographs
Inkscape
Create and edit Scalable Vector Graphics images
Show
All
Sort
Top Rated
GNU Image Manipulation Program
Source: 10.10.160.20
Inkscape
Source: 10.10.160.20
XSane
Source: download-node-02.eng.bos.redhat.com
LibreOffice Draw
Source: 10.10.160.20
Photos
Source: download-node-02.eng.bos.redhat.com



A simple application to access, organize and share your photos on GNOME. It is meant to be a simple and elegant replacement for using a file manager to deal with photos. Seamless cloud integration is offered through GNOME Online Accounts.

It lets you:

- View recent local and online photos
- Access your Facebook or Flickr content
- Send photos to remote DLNA renderers
- Set as background
- Print photos
- Select favorites
- Allow opening full featured editor for more advanced changes

NOTE

Add-ons include for example GNOME Shell extensions, codecs or fonts.

Procedure

1. Start opening a file that is associated with an application or applications that are currently not installed on your system.

2. GNOME will automatically identify suitable application in which the file can be opened, and will offer to download the application.

Procedure

1. Download the required rpm package.

2. Open the directory that includes the downloaded rpm in the Nautilus file manager.

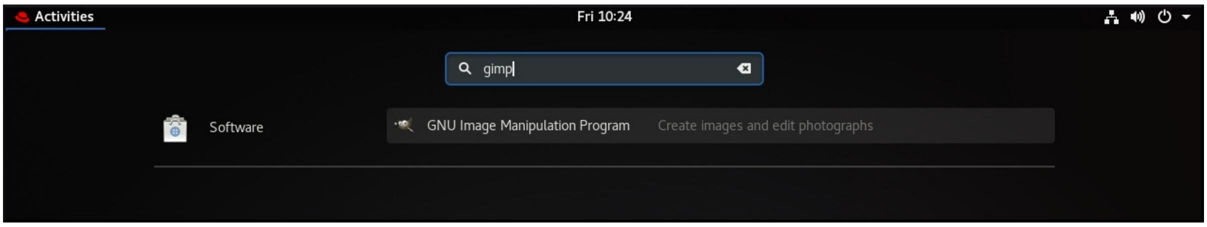
   NOTE

   The downloads are by default stored in the **/home/user/Downloads** directory.

3. Double-click the icon of the rpm to install it.

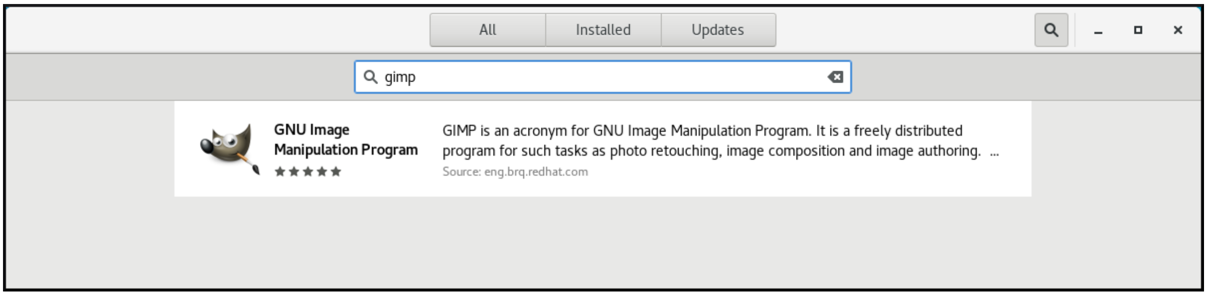
Procedure

1. Start typing the name of the required application in the **search entry**.


Activities
Fri 10:24
gimp
Software
GNU Image Manipulation Program
Create images and edit photographs

GNOME will automatically find the application in a respective repository, and will display the application’s icon.

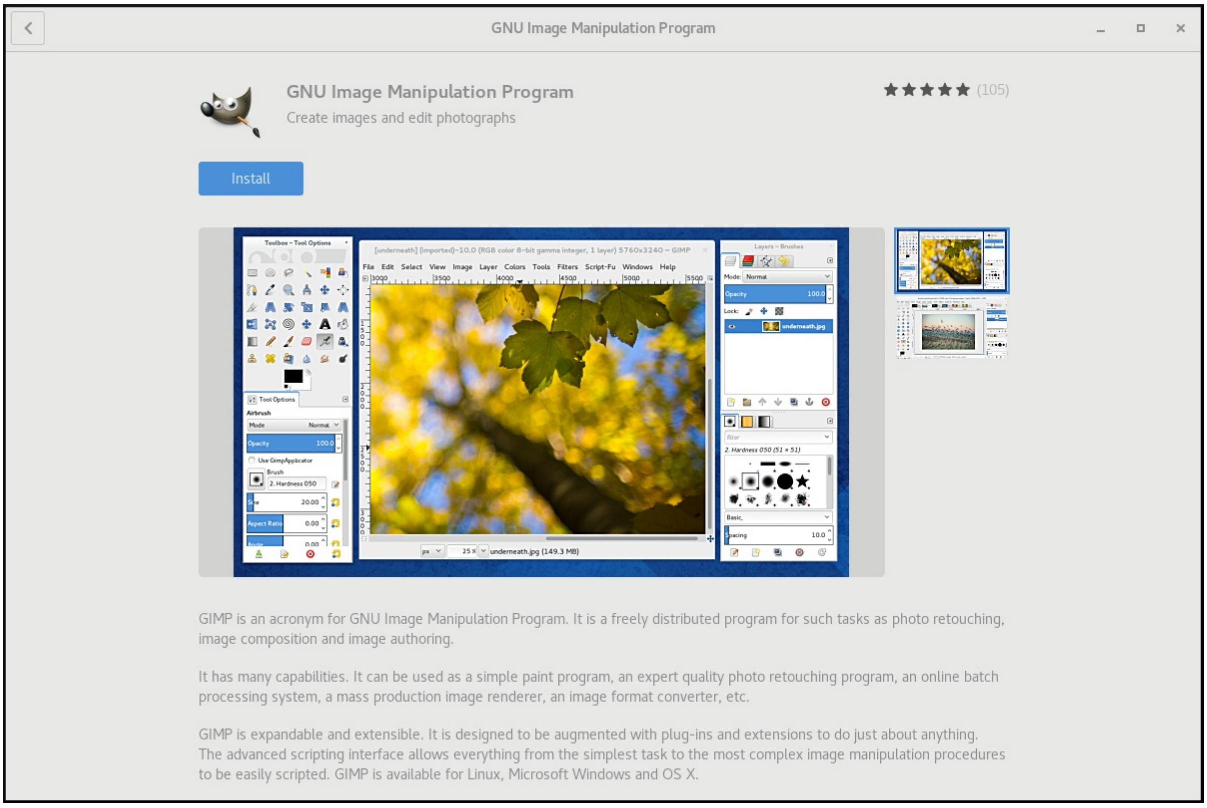
1. Click the application’s icon that automatically appears to open GNOME Software.



GIMP is an acronym for GNU Image Manipulation Program. It is a freely distributed program for such tasks as photo retouching, image composition and image authoring. ...

Source: eng.brq.redhat.com

2. Click again the icon of the application and finish the installation in GNOME Software as described above.


GNU Image Manipulation Program
GNU Image Manipulation Program
Create images and edit photographs
★★★★★ (105)
Install

GIMP is an acronym for GNU Image Manipulation Program. It is a freely distributed program for such tasks as photo retouching, image composition and image authoring.

It has many capabilities. It can be used as a simple paint program, an expert quality photo retouching program, an online batch processing system, a mass production image renderer, an image format converter, etc.

GIMP is expandable and extensible. It is designed to be augmented with plug-ins and extensions to do just about anything. The advanced scripting interface allows everything from the simplest task to the most complex image manipulation procedures to be easily scripted. GIMP is available for Linux, Microsoft Windows and OS X.

Procedure

1. Open a terminal.
2. Run the **yum install** command with the name of the required application:

```
~]# yum install <application_name>
```

1.7. DESKTOP ICONS

In RHEL 8, the **Desktop icons** functionality is no longer provided by the Nautilus file manager, but by the **desktop icons** gnome-shell extension available in the **gnome-shell-extension-desktop-icons** package.

Desktop icons in GNOME Classic

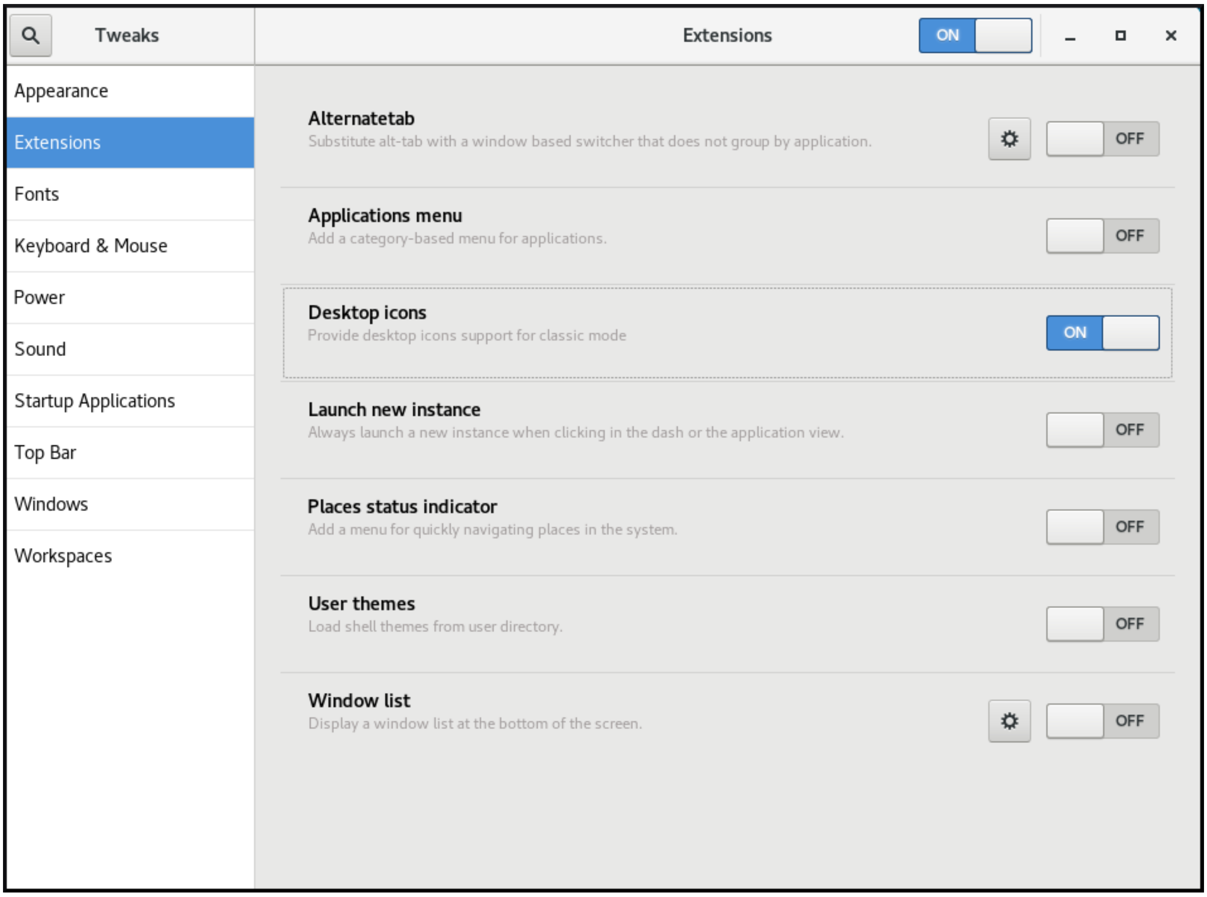
The GNOME Classic environment includes the **gnome-shell-extension-desktop-icons** package by default. Desktop icons are always on, and cannot be turned off. If you want to create a desktop icon for a file, you just need to put this file into the /**Desktop** directory, and the icon appears automatically.

Desktop icons in GNOME Standard

If you have only the GNOME Standard environment available, and not GNOME Classic, you must install **gnome-shell-extension-desktop-icons**.

After the package has been installed, you can switch the desktop icons on or off by using the **Tweaks** application:

1. Go to **Tweaks**, and select **Extensions** - **Desktop icons**, and switch it on.



Extensions ON

Alternatetab — Substitute alt-tab with a window based switcher that does not group by application. — OFF

Applications menu — Add a category-based menu for applications. — OFF

Desktop icons — Provide desktop icons support for classic mode — ON

Launch new instance — Always launch a new instance when clicking in the dash or the application view. — OFF

Places status indicator — Add a menu for quickly navigating places in the system. — OFF

User themes — Load shell themes from user directory. — OFF

Window list — Display a window list at the bottom of the screen. — OFF

2. Put the required file into the /**Desktop** directory, and the icon appears automatically on your desktop.

1.8. HANDLING SOUND

In Red Hat Enterprise Linux 8, sound is handled by the **PulseAudio** sound server that lets programs output the audio using the **Pulseaudio** daemon.

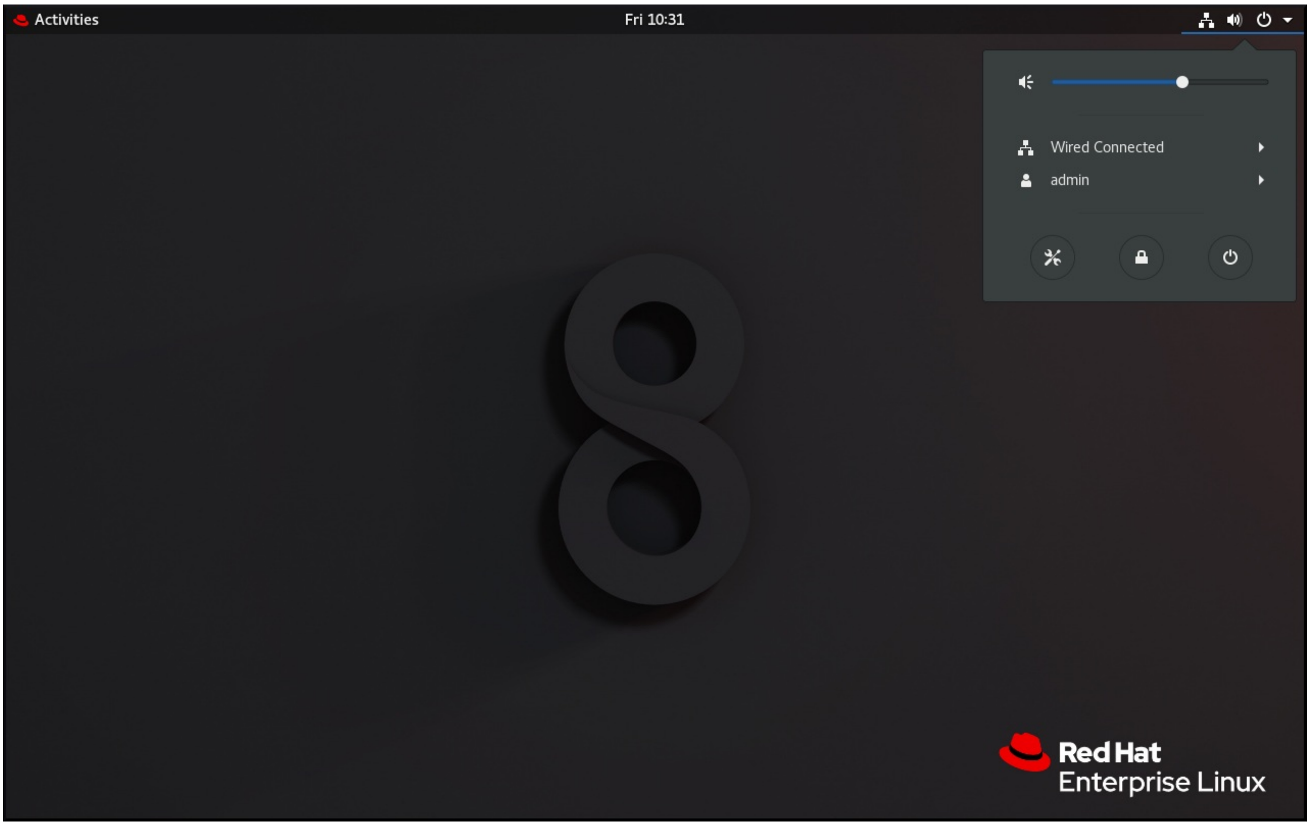
For more information on **PulseAudio**, see the **pulseaudio** man page.

To handle sound, you can use one of these two graphical applications in GNOME:

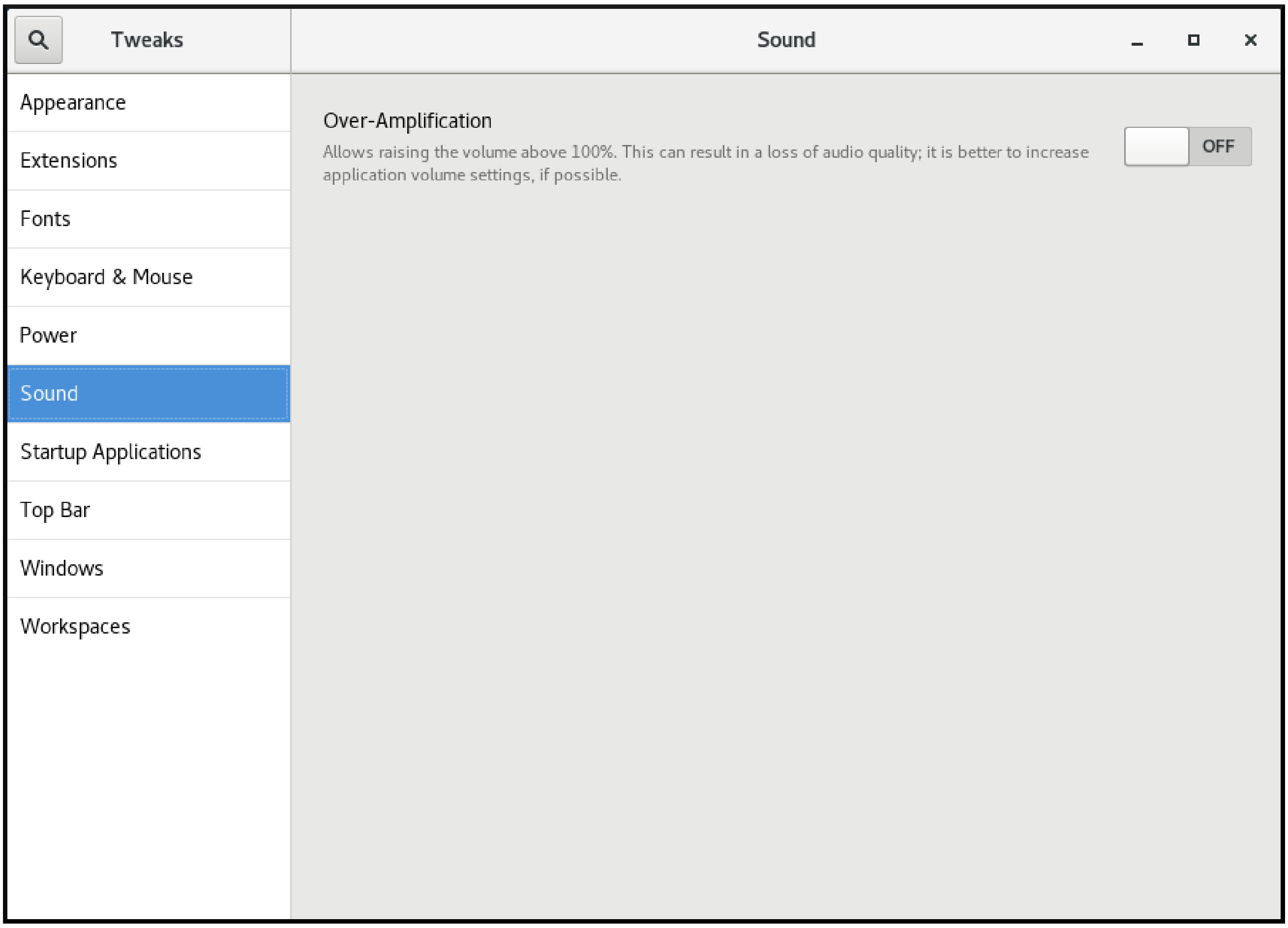
- **System menu**

- **Tweaks** tool
- **GNOME Control Center**

System menu is located in the top right corner, and it only enables you to set the intensity of the sound output or sound input through the sound bar. The sound bar for input sound is available only if you are running an application that is supposed to use an iternal microphone (built-in audio), such as some teleconference tools.



Tweaks tool only enables you to configure the Over-Amplification.

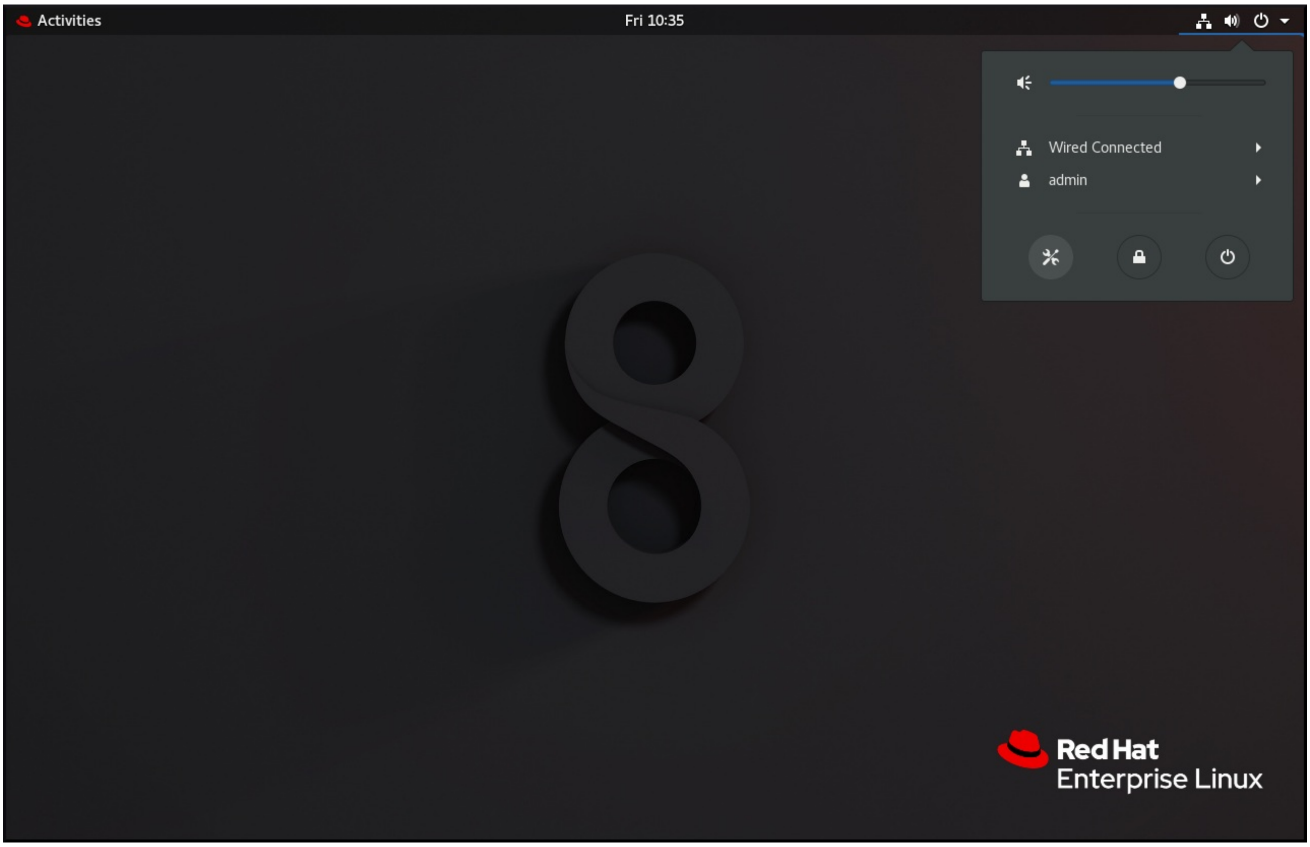


Over-Amplification

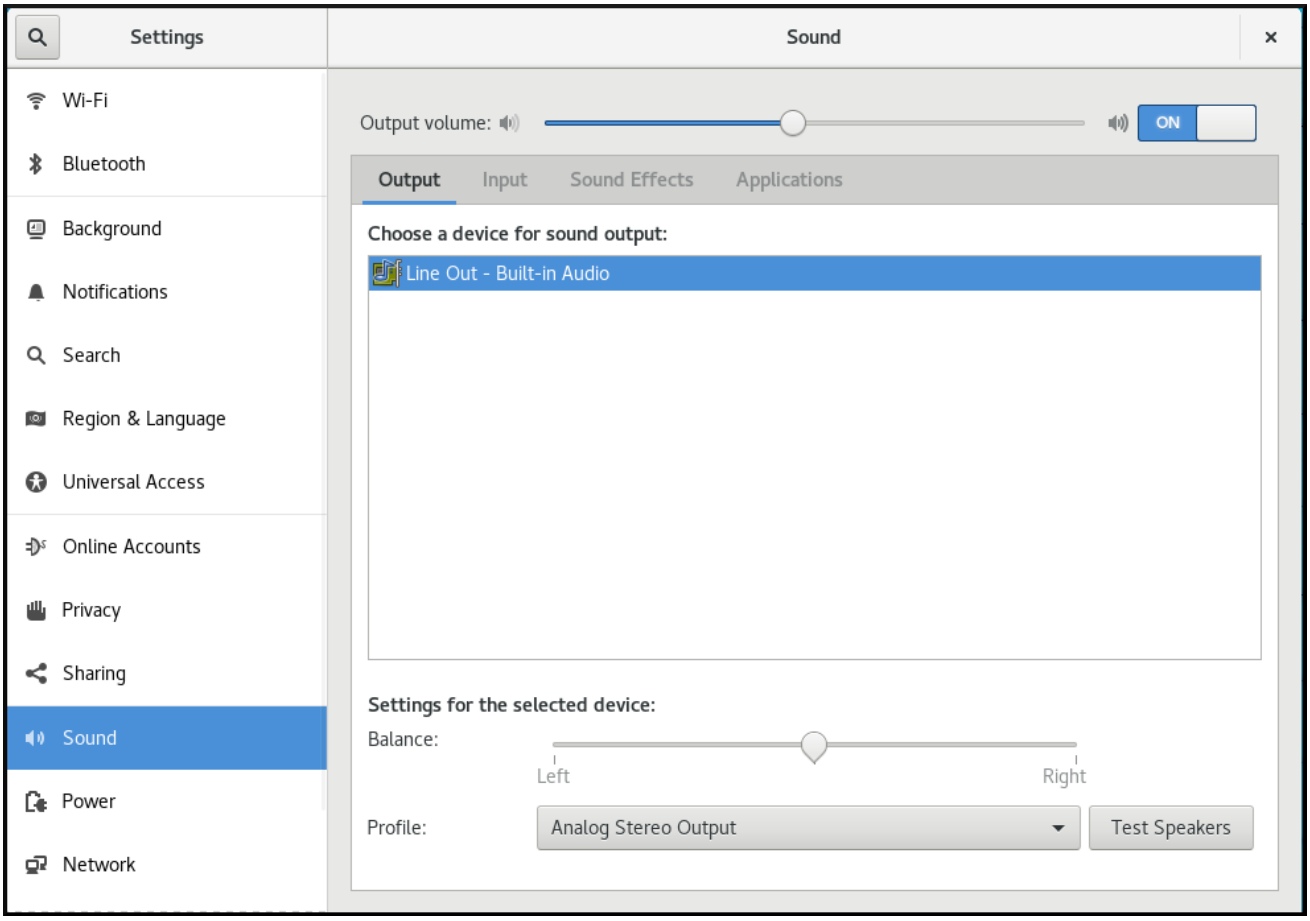
Allows raising the volume above 100%. This can result in a loss of audio quality; it is better to increase application volume settings, if possible.

OFF

GNOME Control Center provides more options to configure sound. You can launch this tool by using one of the approaches described in Launching applications. Moreover, you can also launch it from the **System menu** by clicking on its icon.



When **GNOME Control Center** opens, choose **Sound** from the left vertical bar.



Output volume: ON

Choose a device for sound output:

Line Out - Built-in Audio

Settings for the selected device:

Balance:

Profile: Analog Stereo Output

Through **GNOME Control Center** - **Sound**, you can configure the following:

- **Output** sound
- **Input** sound
- **Sound effects**
- **Applications**

The **Output** and **Input** menus show only the built-in audio devices unless you connect any external device that can handle sound.

The **Output** menu enables you to select the required profile from available analog or digital profiles that are displayed depending on available output devices.

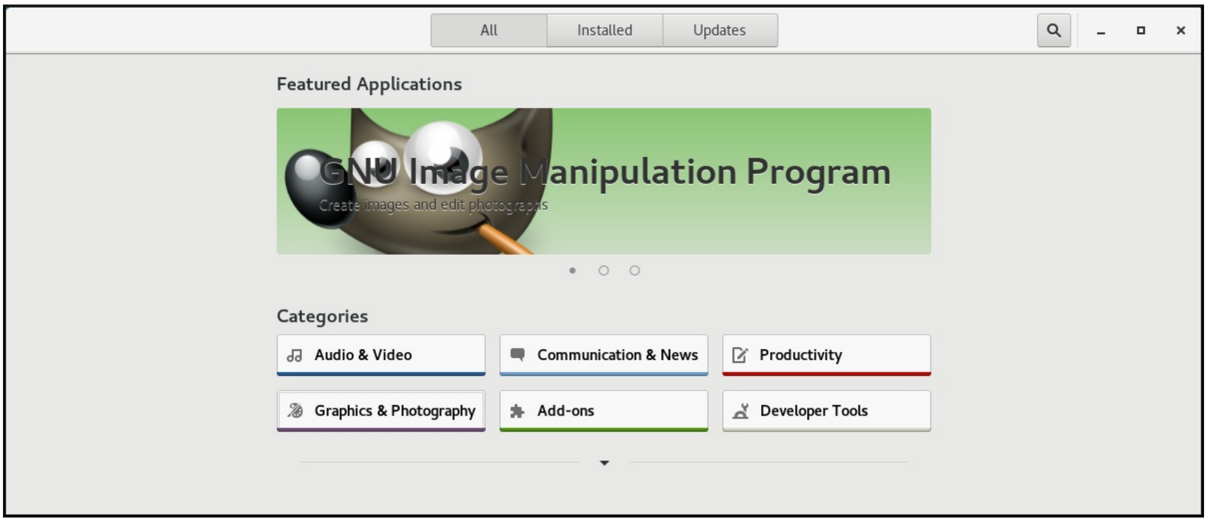
The **Applications** menu shows all currently running applications that can process sound, and allows you to amplify or lower the sound of a particular application.

1.9. HANDLING GRAPHICS AND PHOTOS

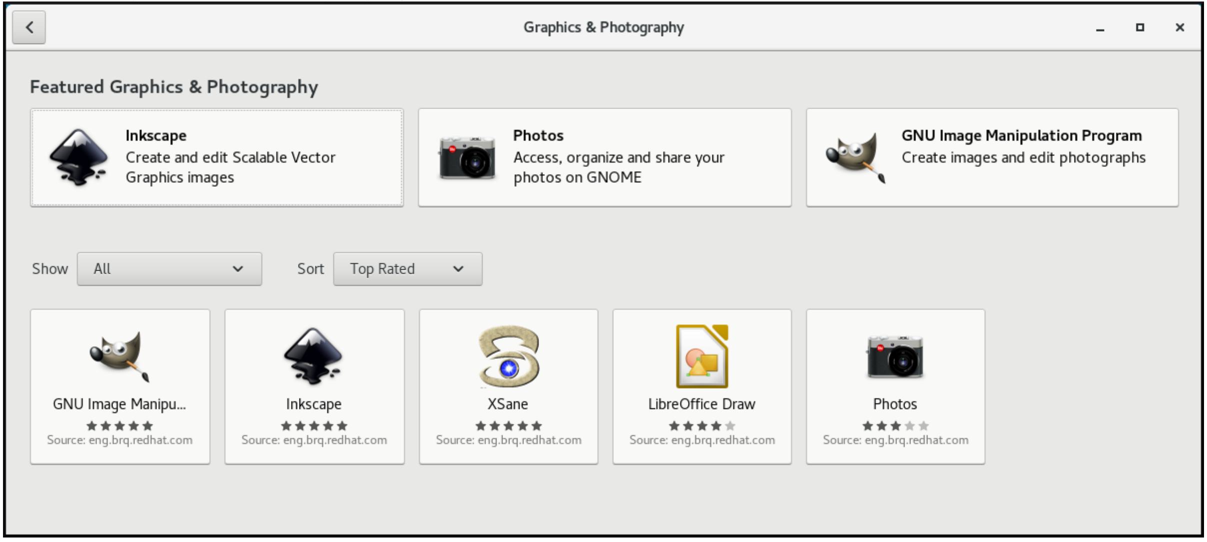
GNOME Shell provides multiple tools to handle graphics and photography.

You can check the available tools under the **Graphics & Photography** menu in GNOME Software:

1. Open the GNOME software.



2. Go to **Graphics & Photography**.


Graphics & Photography
Featured Graphics & Photography
Inkscape
Create and edit Scalable Vector Graphics images
Photos
Access, organize and share your photos on GNOME
GNU Image Manipulation Program
Create images and edit photographs
Show
All
Sort
Top Rated
GNU Image Manipu...
Source: eng.brq.redhat.com
Inkscape
Source: eng.brq.redhat.com
XSane
Source: eng.brq.redhat.com
LibreOffice Draw
Source: eng.brq.redhat.com
Photos
Source: eng.brq.redhat.com

The available tools include:

- **Photos**
  For accessing, organizing and sharing your photos.
- **GNU Image Manipulation Program**
  For creating images and editing photographs.
- **Inkspace**
  For creating and editing scalable vector graphics images.
- **XSane**
  For scanning images with a scanner.
- **LibreOffice Draw**
  For create and editing drawings, flow charts, and logos.

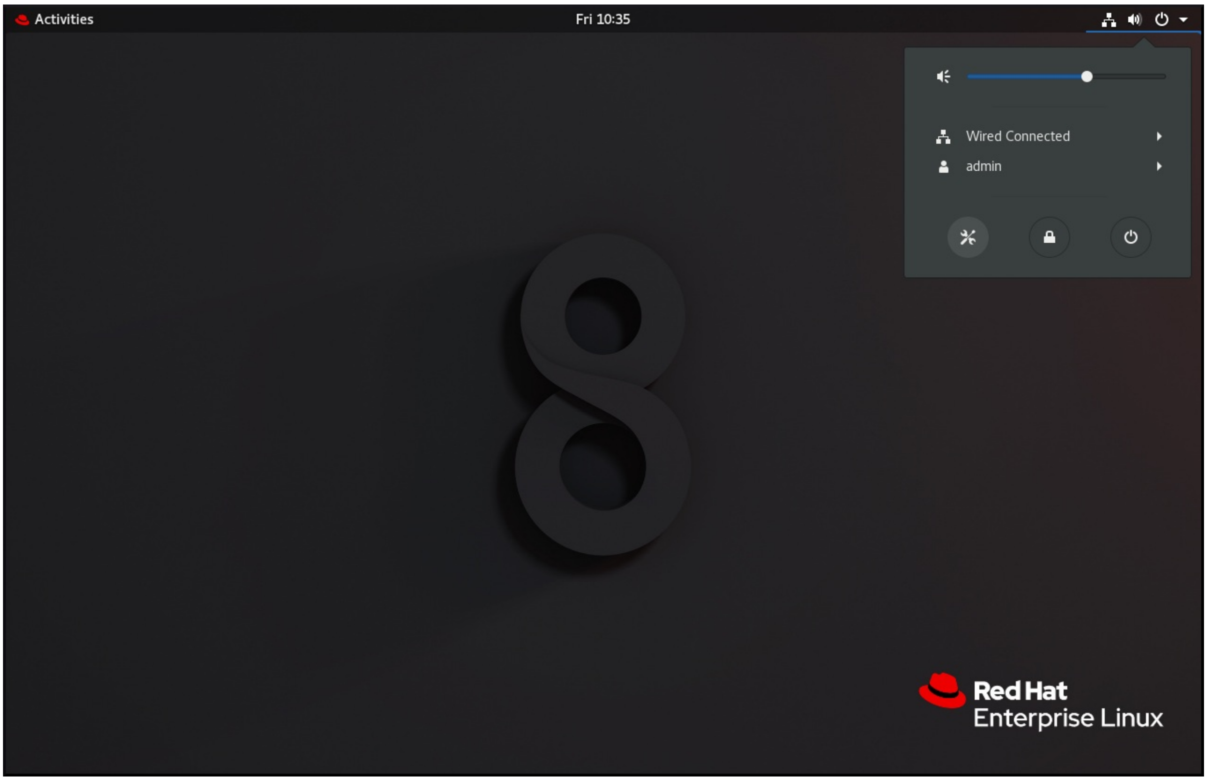
1.10. HANDLING PRINTING

In GNOME Shell, printing can be set up using the **GNOME Control center** GUI.

1.10.1. Starting GNOME control center for setting up printing

Procedure

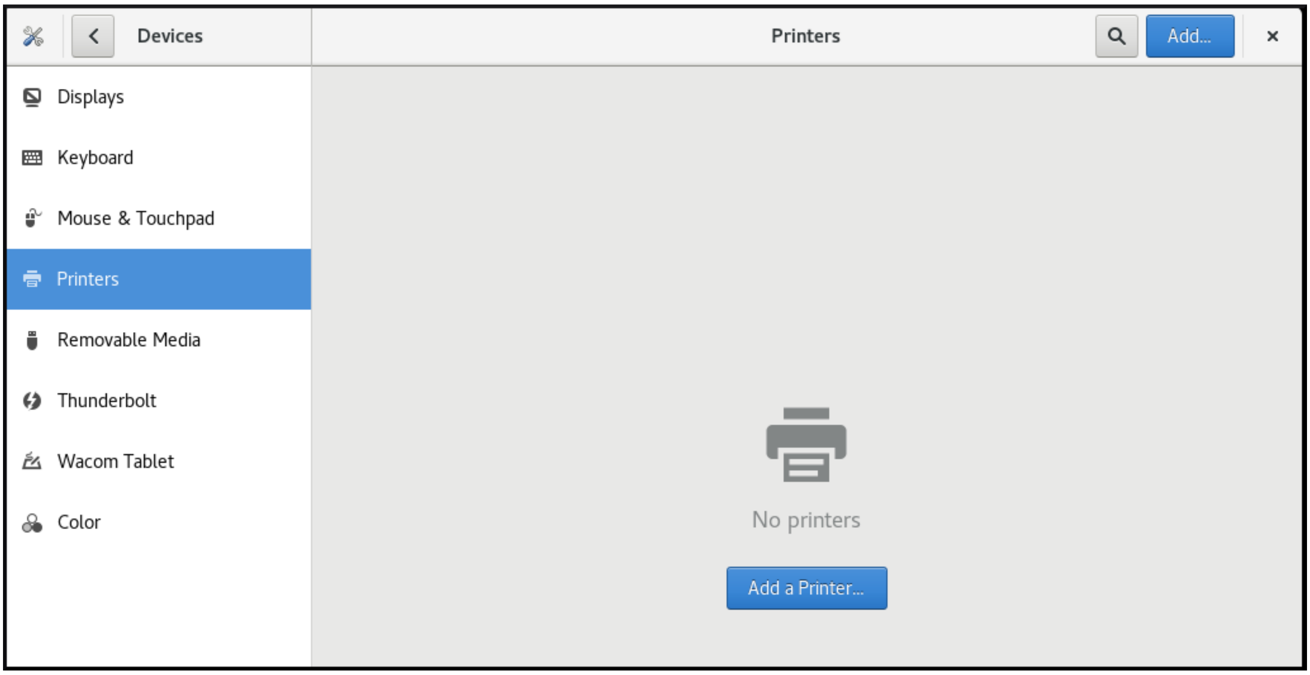
1. Use one of the approaches described in Section 1.5, “Launching applications” to start the **GNOME Control center** GUI.
   Moreover, you can also start the GNOME Control center from the **system menu** in the top right corner by clicking on the "Settings" icon.



2. When the **GNOME Control center** GUI appears, go to:

Devices → Printers

Figure 1.1. GNOME Control center configuration tool



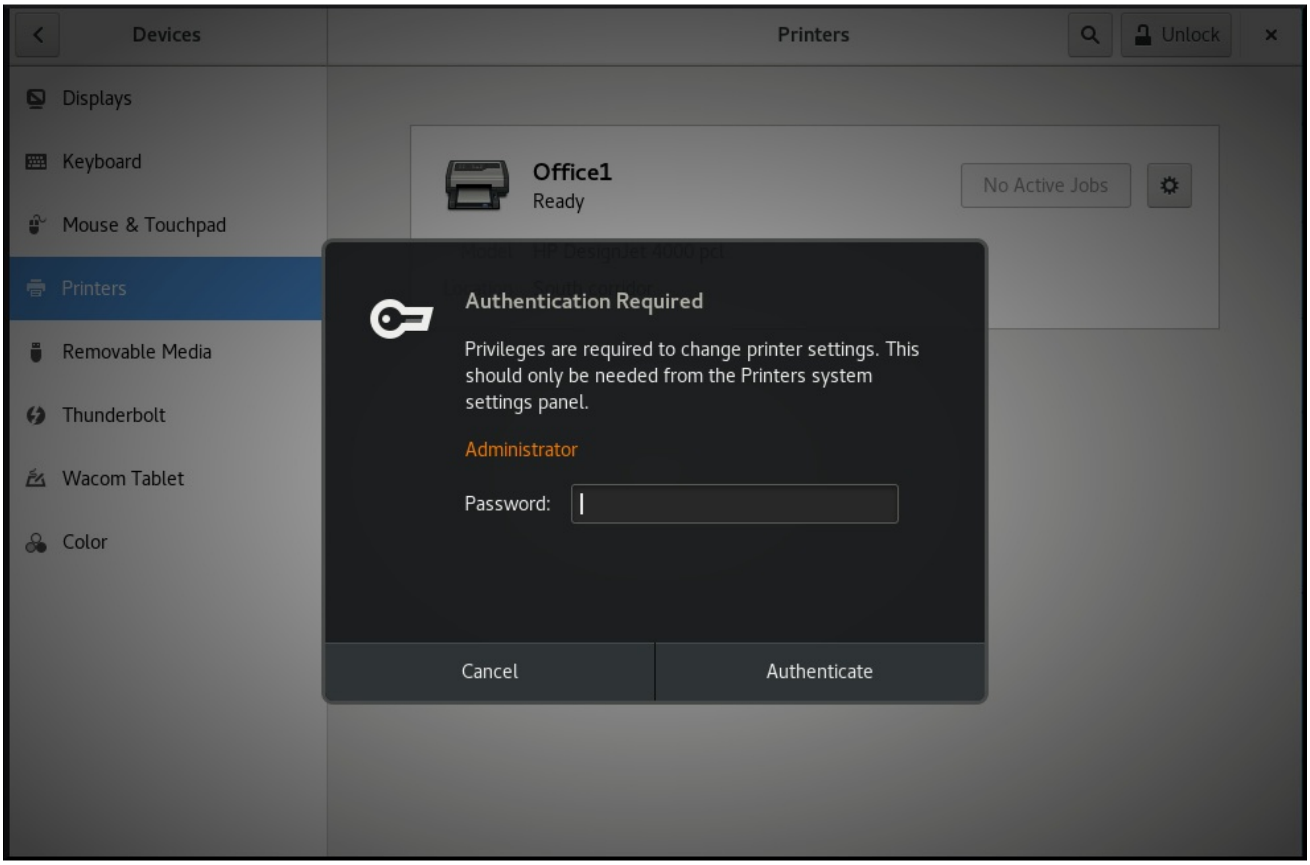
1.10.2. Adding a new printer in GNOME Control center

This section describes how to add a new printer using the **GNOME Control center** GUI.

Prerequisites

To be able to add a new printer using the **GNOME Control center** GUI, you must click on **Unlock**, which appears on the right side of the top bar, and authenticate as one of the following users:

- Superuser
- Any user with the administrative access provided by **sudo** (users listed within **/etc/sudoers**)
- Any user belonging to the **printadmin** group in **/etc/group**



Authentication Required

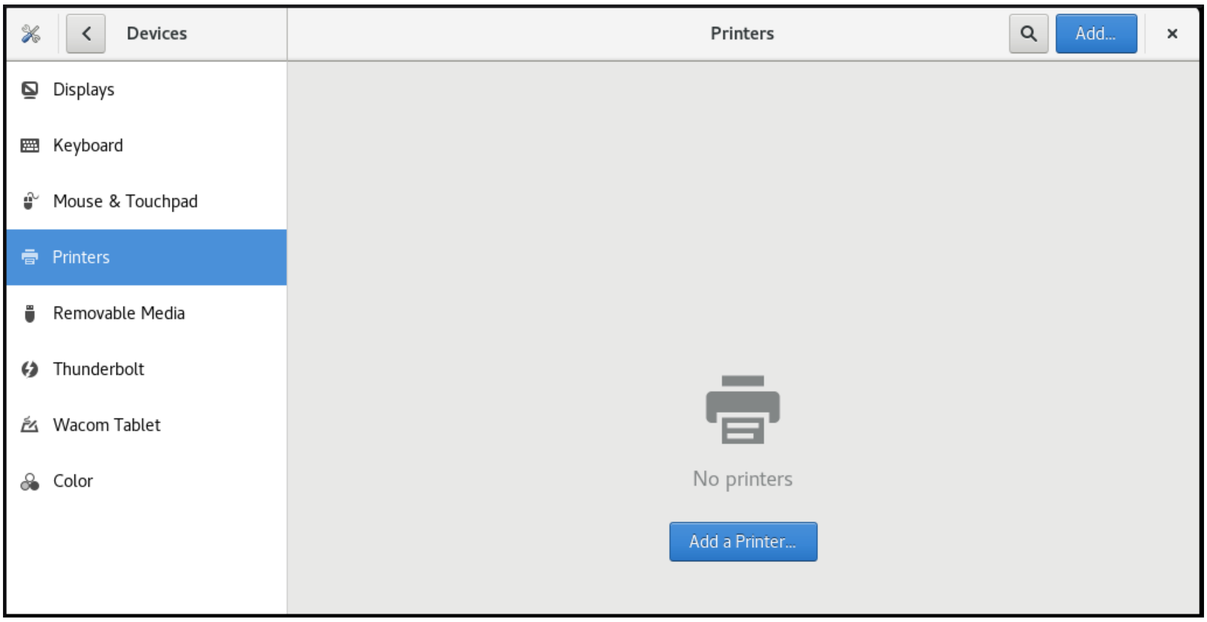
Privileges are required to change printer settings. This should only be needed from the Printers system settings panel.

Administrator

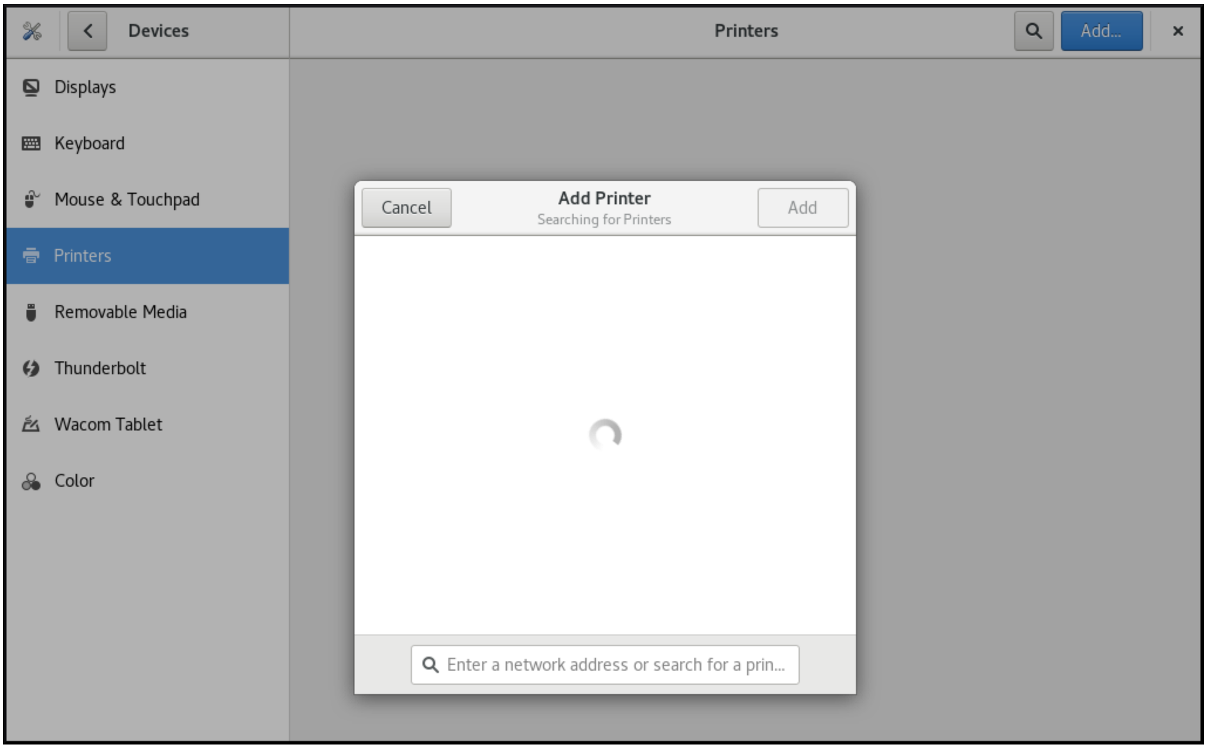
Password:

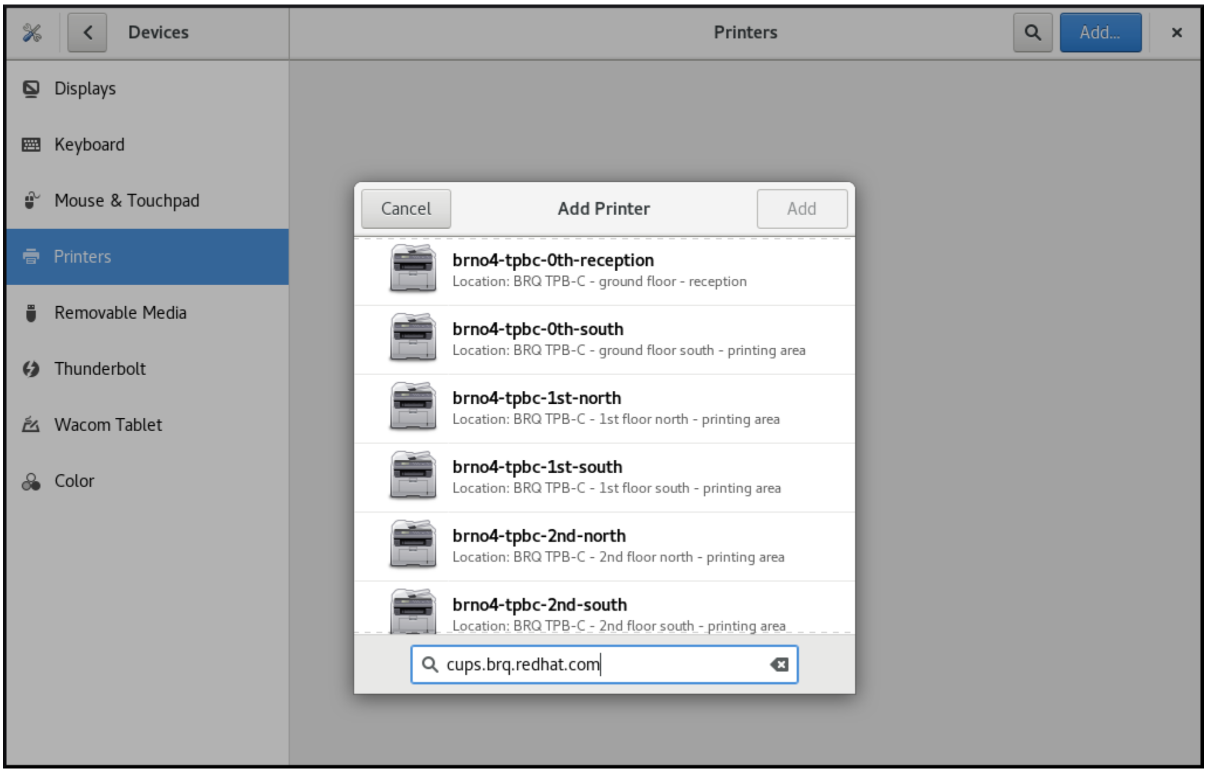
Procedure

1. Open the Add Printer dialog.



2. Select one of the available printers (including also network printers), or enter printer IP address or the hostname of a printer server.





brno4-tpbc-0th-reception
Location: BRQ TPB-C - ground floor - reception

brno4-tpbc-0th-south
Location: BRQ TPB-C - ground floor south - printing area

brno4-tpbc-1st-north
Location: BRQ TPB-C - 1st floor north - printing area

brno4-tpbc-1st-south
Location: BRQ TPB-C - 1st floor south - printing area

brno4-tpbc-2nd-north
Location: BRQ TPB-C - 2nd floor north - printing area

brno4-tpbc-2nd-south
Location: BRQ TPB-C - 2nd floor south - printing area

cups.brq.redhat.com

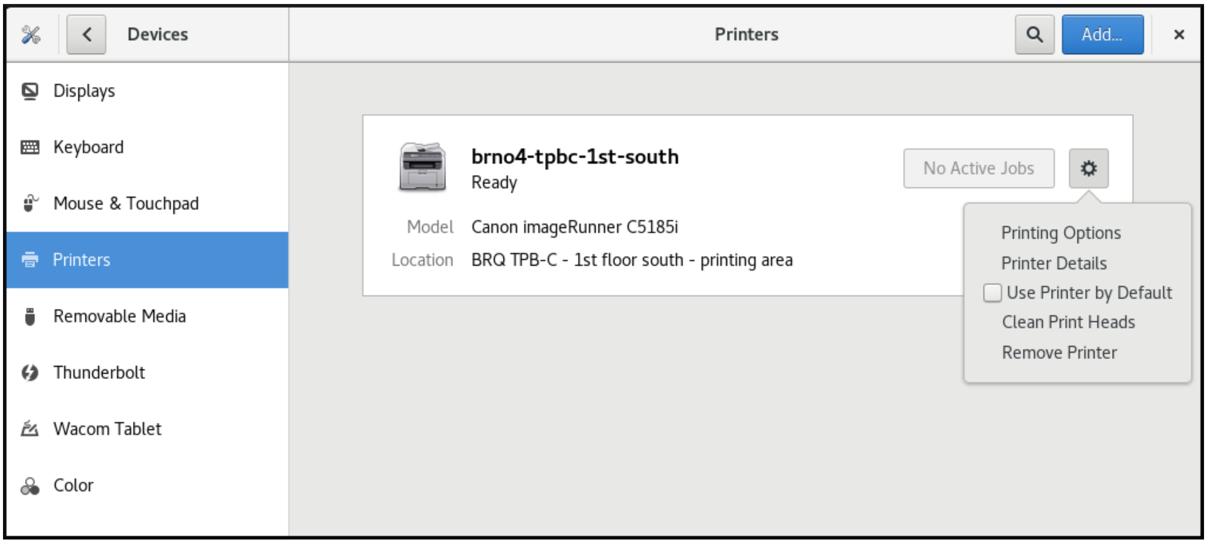
1.10.3. Configuring a printer in GNOME Control center

This section describes how to configure a new printer, and how to maintain a configuration of a printer using the **GNOME Control center** GUI.

Displaying printer’s settings menu

Procedure

- Click the "settings" button on the right to display a settings menu for the selected printer:



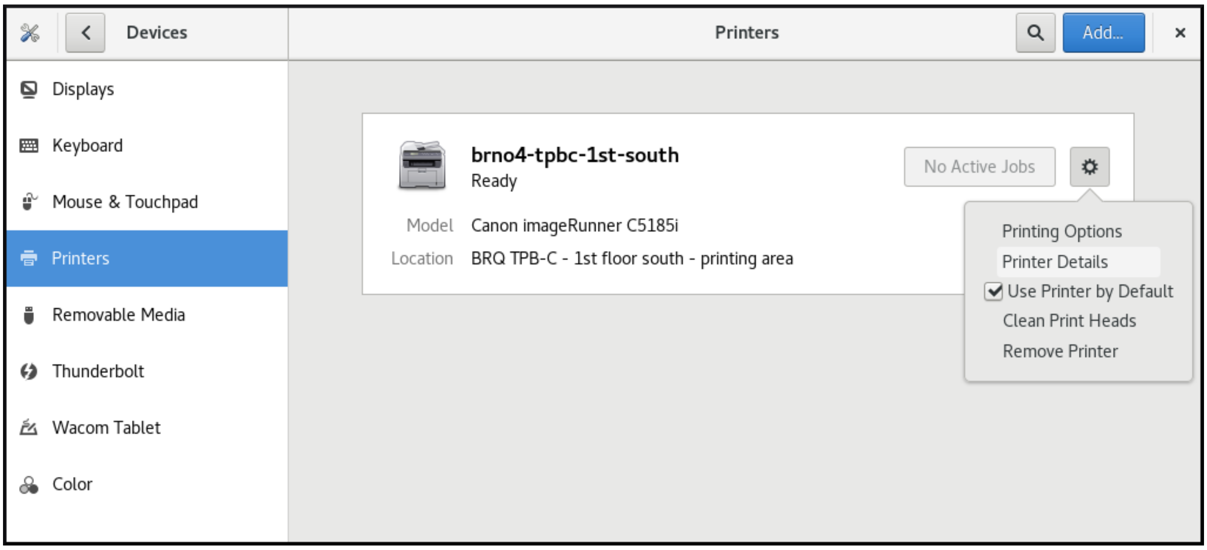
brno4-tpbc-1st-south
Ready

Model Canon imageRunner C5185i
Location BRQ TPB-C - 1st floor south - printing area

Displaying and modifying printer’s details

Procedure

- Click **Printer Details** to display and modify selected printer’s settings:



brno4-tpbc-1st-south
Ready

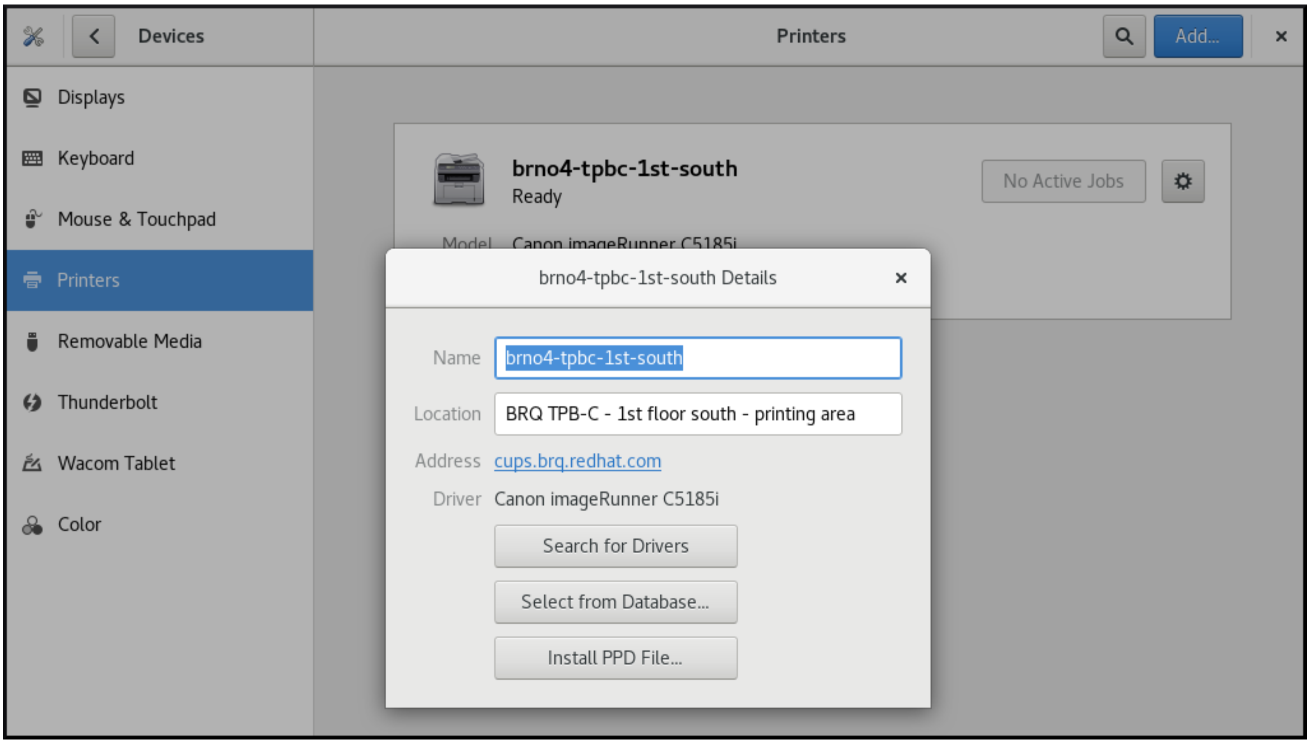
Model Canon imageRunner C5185i
Location BRQ TPB-C - 1st floor south - printing area

With this menu you can:

- **Search for Drivers**
  GNOME Control Center communicates with **PackageKit** that searches for a suitable driver suitable in available repositories.

- **Select from Database**
  This option enables you to select a suitable driver from databases that have already been installed on the system.

- **Install PPD File**
  This option enables you to select from a list of available postscript printer description (PPD) files that can be used as a driver for your printer.



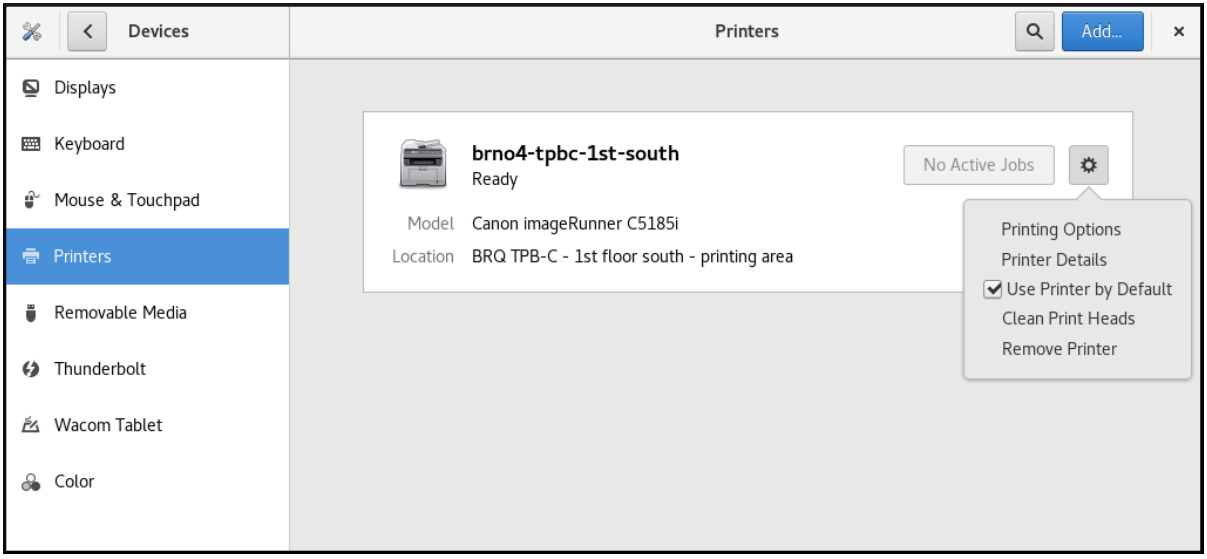
brno4-tpbc-1st-south Details

Name brno4-tpbc-1st-south
Location BRQ TPB-C - 1st floor south - printing area
Address cups.brq.redhat.com
Driver Canon imageRunner C5185i

Setting the default printer

Procedure

- Click **Use Printer by Default** to set the selected printer as the default printer:



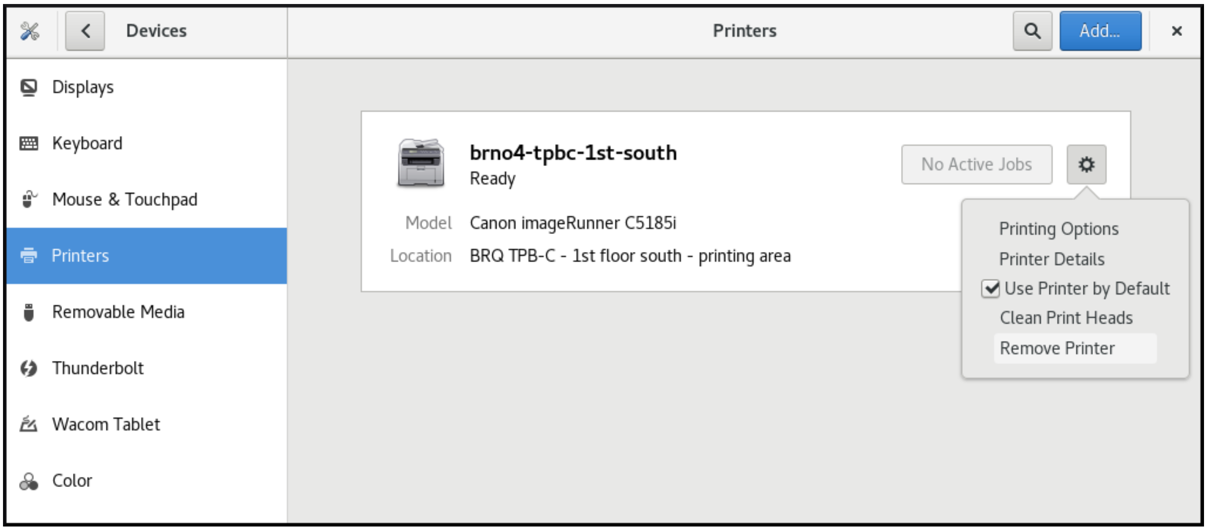
brno4-tpbc-1st-south
Ready

Model Canon imageRunner C5185i
Location BRQ TPB-C - 1st floor south - printing area

Removing a printer

Procedure

- Click **Remove Printer** to remove the selected printer:



brno4-tpbc-1st-south
Ready

Model Canon imageRunner C5185i
Location BRQ TPB-C - 1st floor south - printing area

1.10.4. Printing a test page in GNOME Control Center

This section describes how to print a test page to make sure that the printer functions properly.

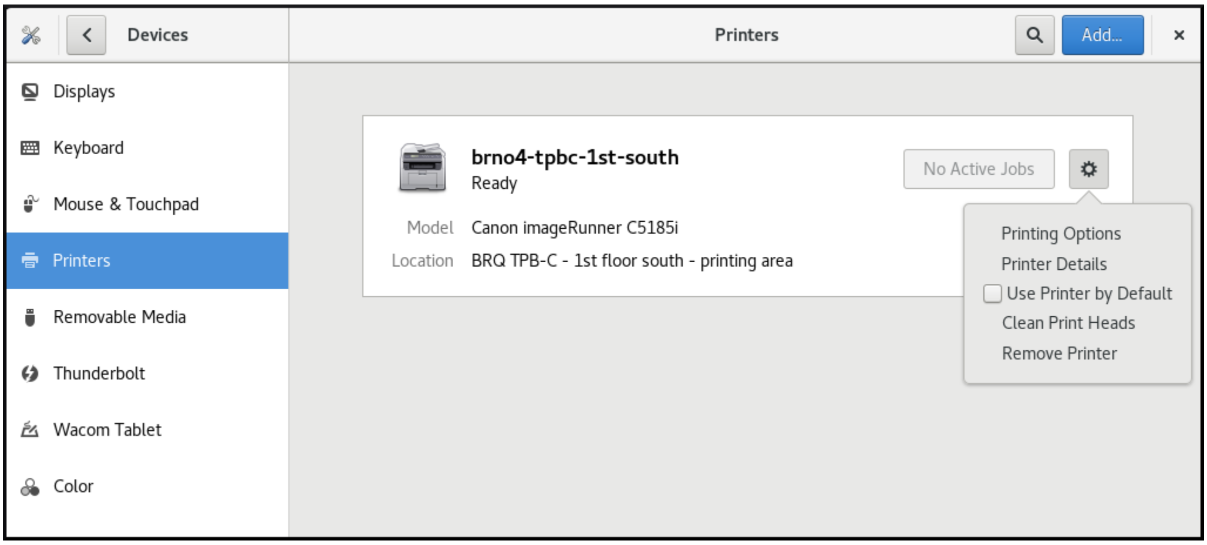
You might want to print a test page if one of the below prerequisites is met.

Prerequisites

- A printer has been set up.
- A printer configuration has been changed.

Procedure

1. Click the "settings" button on the right to display a settings menu for the selected printer:



brno4-tpbc-1st-south
Ready

Model Canon imageRunner C5185i
Location BRQ TPB-C - 1st floor south - printing area

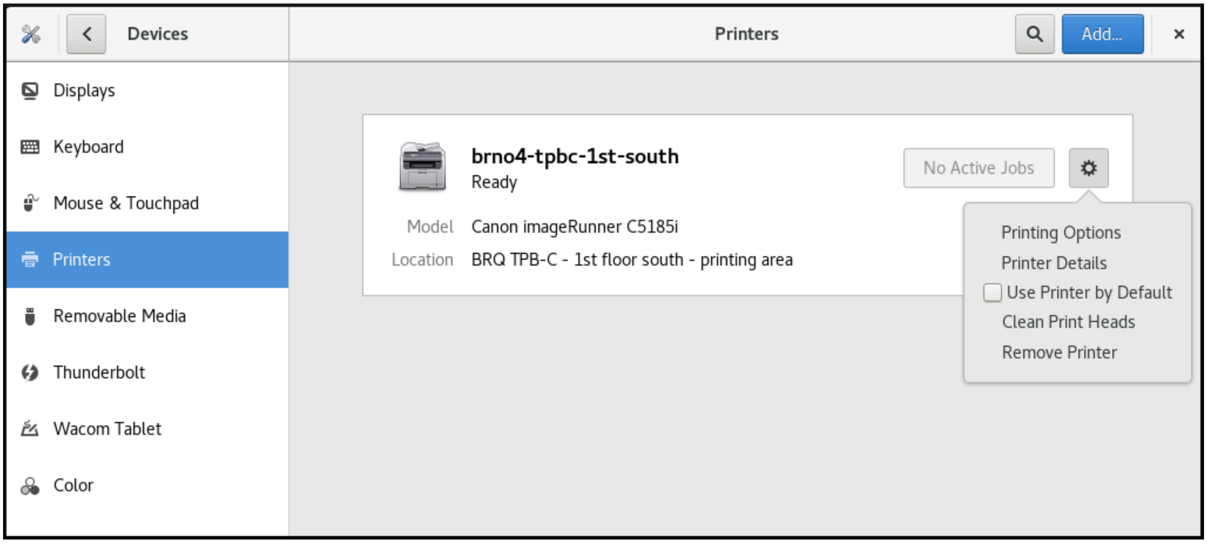
2. Click **Printing Options → Test Page**

1.10.5. Setting print options using GNOME Control center

This section describes how to set print options using the **GNOME Control center** GUI.

Procedure

1. Click the "settings" button on the right to display a settings menu for the selected printer:



brno4-tpbc-1st-south
Ready

Model Canon imageRunner C5185i
Location BRQ TPB-C - 1st floor south - printing area

2. Click **Printing Options**

1.11. SHARING MEDIA BETWEEN APPLICATIONS

Red Hat Enterprise Linux 8 includes the PipeWire media server, which ensures access to multimedia devices and media sharing between applications.

When running a remote desktop session on **GNOME Shell on Wayland**, PipeWire and the VNC server is used. The functionality of remote desktop session is provided by the **gnome-remote-desktop** and **pipewire** packages.

On **X.Org**, just VNC is needed to run a remote desktop session. This functionality on **X.Org** is provided by the **vino** package.

PipeWire is used also with teleconference tools such as BlueJeans when running on **GNOME Shell on Wayland**. In such case, the **pipewire service** is activated automatically when you start sharing your screen within the teleconference tool.

To check the status of the **pipewire service**, run:

```
~]$ systemctl --user status pipewire
```

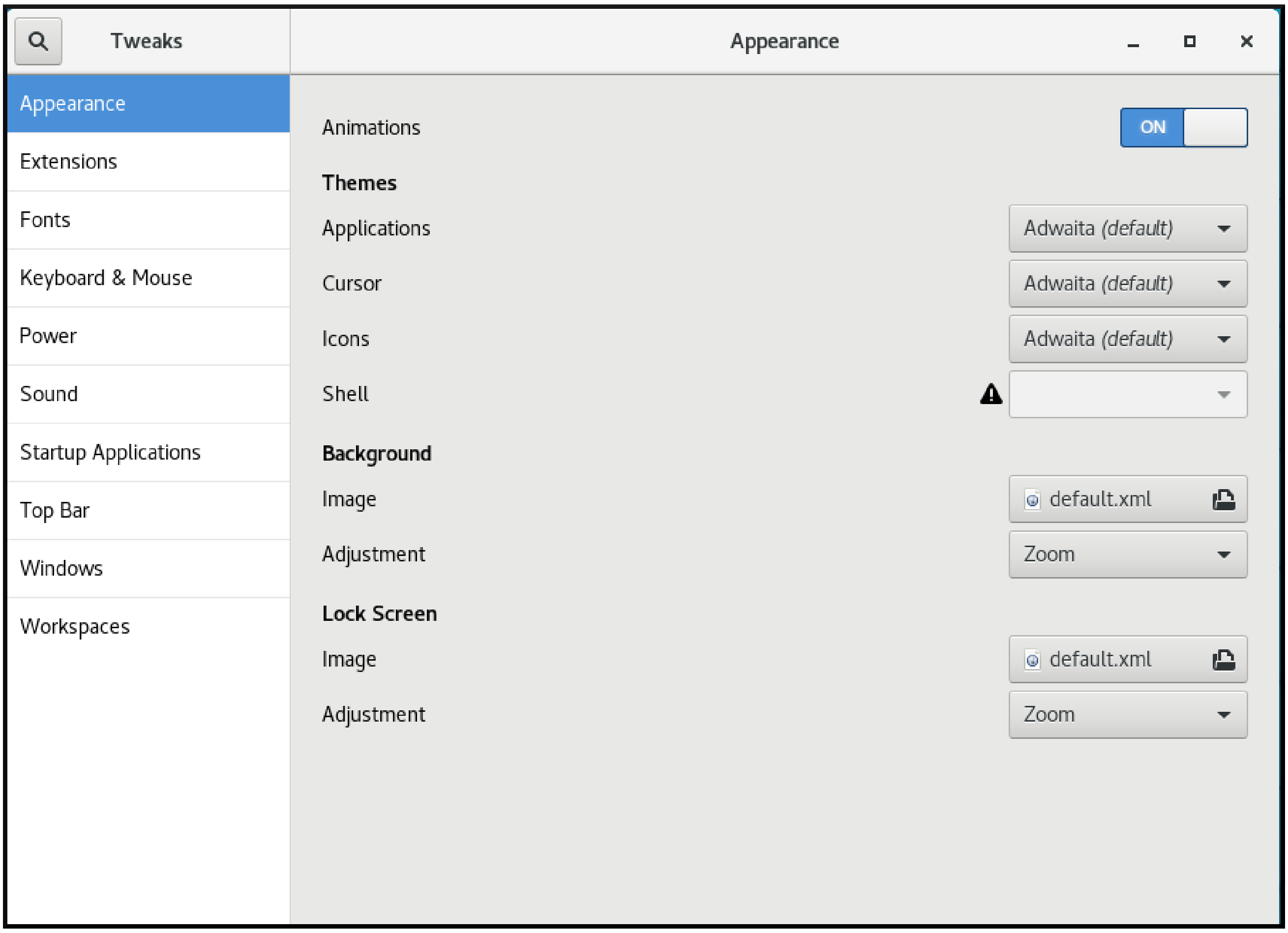
1.12. CUSTOMIZING GNOME SHELL ENVIRONMENT WITH THE TWEAKS TOOL

You can customize the GNOME Shell environment for a particular user by using the **Tweaks** tool.

To open **Tweaks**, use one of the approaches described in Section 1.5, “Launching applications”.

To choose the required item that you want to customize, use the vertical menu on the left. For example you can choose the applications to start automatically when you log in by using the **Statup Applications** menu, or you can customize your top bar appearance by using the **Top Bar** menu.

The Tweaks tool



Animations ON

Themes

Applications Adwaita *(default)*

Cursor Adwaita *(default)*

Icons Adwaita *(default)*

Shell ⚠

Background

Image default.xml

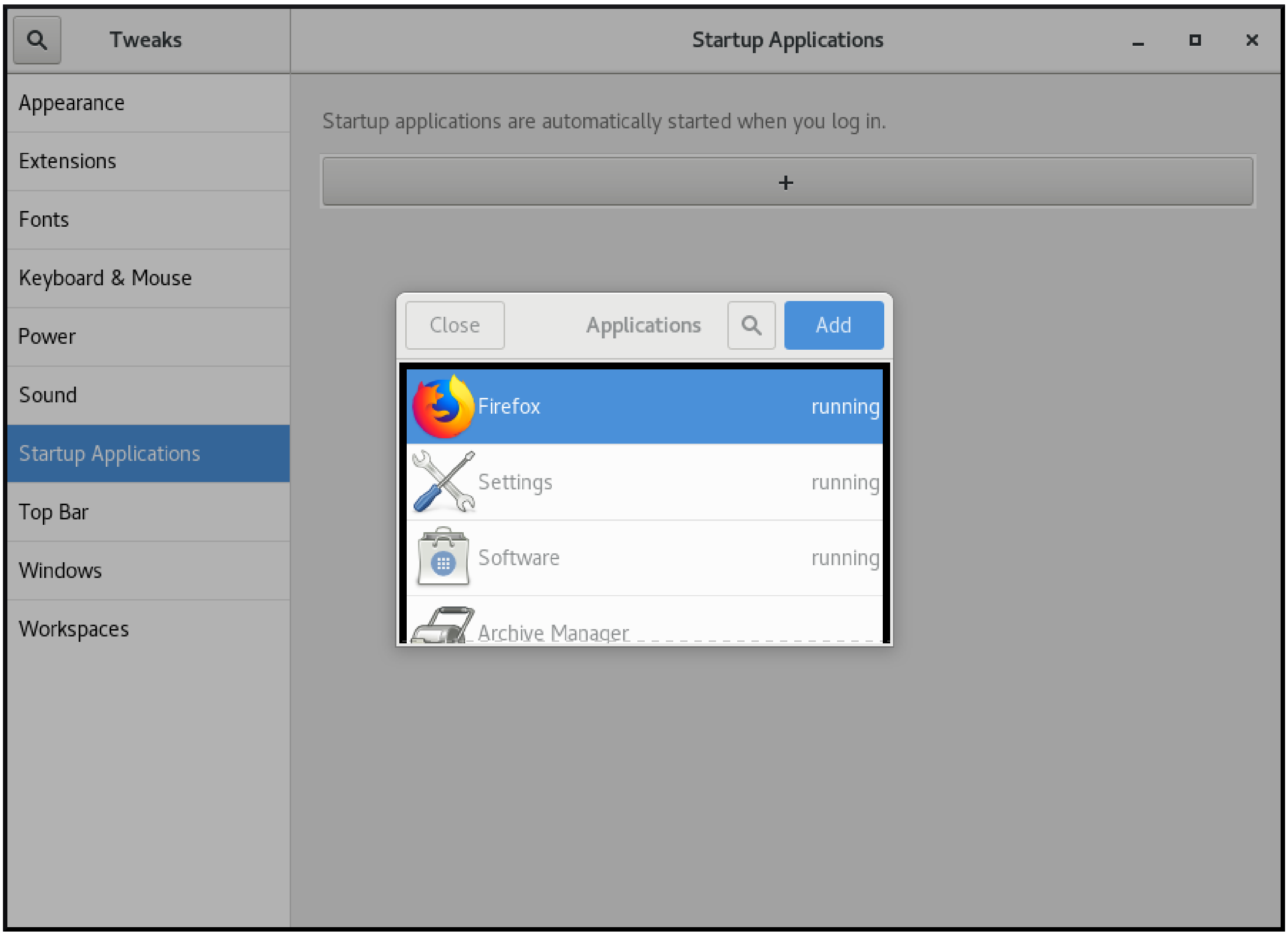
Adjustment Zoom

Lock Screen

Image default.xml

Adjustment Zoom

Customizing startup applications in Tweaks



Startup applications are automatically started when you log in.

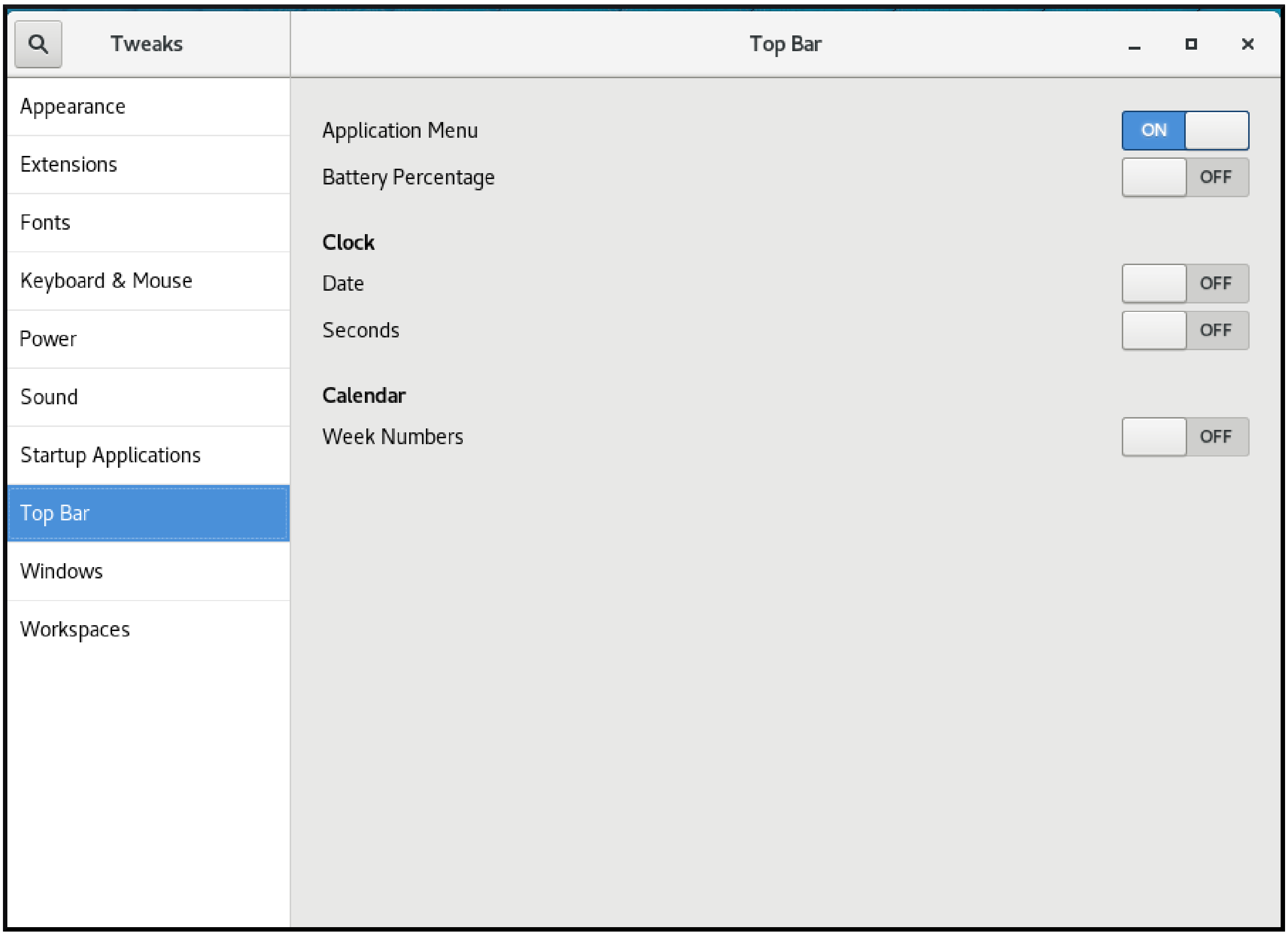
Firefox running

Settings running

Software running

Archive Manager

Customizing the appearance of your top bar in Tweaks



Application Menu ON

Battery Percentage OFF

Clock

Date OFF

Seconds OFF

Calendar

Week Numbers OFF

CHAPTER 2. GRAPHICS STACKS IN RHEL 8

In Red Hat Enterprise Linux 8, you can choose between two protocols to build a graphical user interface:

- **X11**
- **Wayland**

The **X11** protocol uses **X.Org** as the display server. Displaying graphics based on this protocol works the same way as in Red Hat Enterprise Linux 7, where this was the only option.

The **Wayland** protocol on Red Hat Enterprise Linux 8 uses **GNOME Shell** as its compositor and display server, which is further referred as **GNOME Shell on Wayland** Displaying graphics based on the **Wayland** protocol has some differences and limitation compared to **X11**.

New installations of Red Hat Enterprise Linux 8 automatically select **GNOME Shell on Wayland** However, you can switch to **X.Org**, or select the required combination of GNOME environment and display server as described in Section 1.4, “Selecting GNOME environment and display protocol” .

Note that there are also a few environments where **X.Org** is preferred over **GNOME Shell on Wayland**, such as:

- Cirrus graphics used in a VM environment
- Matrox graphics
- Aspeed graphics
- QXL graphics used in a VM environment
- Nvidia graphics when used with the proprietary driver

IMPORTANT

The Nvidia graphics by default use **nouveau**, which is an open source driver. **nouveau** is supported on **Wayland**, hence you can use Nvidia graphics with **nouveau** on **GNOME Shell on Wayland** without any limitations. However, using Nvidia graphics with proprietary Nvidia binary drivers is not supported on **GNOME Shell on Wayland** In this case, you need to switch to **X.Org** as described in Section 1.4, “Selecting GNOME environment and display protocol”.

2.1. KEY DIFFERENCES BETWEEN THE WAYLAND AND X11 PROTOCOL

X11 applications

Client applications need to be ported to the **Wayland** protocol or use a graphical toolkit that has a **Wayland** backend, such as GTK, to be able to work natively with the compositor and display server based on **Wayland**.

Legacy **X11** applications that cannot be ported to **Wayland** automatically use **Xwayland** as a proxy between the **X11** legacy clients and the **Wayland** compositor. **Xwayland** functions both as an **X11** server and a **Wayland** client. The role of **Xwayland** is to translate the **X11** protocol into the **Wayland** protocol and reversely, so that **X11** legacy applications can work with the display server based on **Wayland**.

On **GNOME Shell on Wayland**, **Xwayland** is started automatically at startup, which ensures that most **X11** legacy applications work as expected when using **GNOME Shell on Wayland** However, the **X11** and

Wayland protocols are different, and hence some clients relying on **X11**-specific features may behave differently under **Xwayland**. For such specific clients, you can switch to the **X.Org** display server as described in Section 1.4, "Selecting GNOME environment and display protocol" .

libinput

Red Hat Enterprise Linux 8 uses a new unified input stack, **libinput**, which manages all common device types, such as mice, touchpads, touchscreens, tablets, trackballs and pointing sticks. This unified stack is used both by the **X.Org** and by the **GNOME Shell on Wayland** compositor.

GNOME Shell on Wayland uses **libinput** directly for all devices, and no switchable driver support is available. Under **X.Org**, **libinput** is implemented as the **X.Org libinput** driver, and driver support is outlined below.

Mice, touchscreens, trackballs, pointing sticks

Red Hat Enterprise Linux 8 uses the **X.Org libinput** driver for these devices. The **X.Org evdev** driver, which was used in Red Hat Enterprise Linux 7, is available as fallback where required.

Touchpads

Red Hat Enterprise Linux 8 uses the **X.Org libinput** driver for touchpads. The **X.Org synaptics** driver, which was used for touchpads in Red Hat Enterprise Linux 7, is no longer available.

Graphics tablets

Red Hat Enterprise Linux 8 continues using the **X.Org wacom** driver, which was used for tablet devices in Red Hat Enterprise Linux 7. However, the **X.Org** libinput driver is available where required.

Other input devices

Red Hat Enterprise Linux 7 used the **X.Org evdev** driver for other input devices that are not included in the above categories. Red Hat Enterprise Linux 8 uses the **X.Org libinput** driver by default but can fall back to the **X.Org evdev** driver if a device is incompatible with **libinput**.

Gestures

GNOME Shell on Wayland supports new touchpad and touchscreen gestures. These gestures include:

- Switching workspaces by dragging up or down with four fingers.
- Opening the **Activities Overview** by bringing three fingers closer together.

2.2. CURRENT WAYLAND LIMITATIONS

Nvidia drivers

Proprietary Nvidia binary drivers are not supported with **GNOME Shell** on **Wayland**. To avoid any complications while using the Nvidia GPU, **GNOME Shell** automatically falls back to **X.Org**, which means that the login screen does not provide any option based on the **Wayland** protocol.

> **NOTE**
>
> The **nouveau** driver is still supported and is the default driver for Nvidia graphics.

Remote desktop

With **GNOME Shell on Wayland**, VNC support is provided by the **gnome-remote-desktop** package. Remote access using VNC via **gnome-remote-desktop** currently requires an already logged in session, and only the primary monitor is accessible. Screen sharing with **GNOME Shell on Wayland** is possible using the PipeWire media server. For more details on the PipeWire media server, see PipeWire project.

For more advanced VNC usage, you need to switch to **X.org**, where traditional VNC tools are available. For more information, see Section 1.4, “Selecting GNOME environment and display protocol” .

X Display Manager

The X Display Manager Control Protocol (XDMCP) is not supported with **GNOME Shell** on **Wayland**.

Hence, it is not possible to use the X display manager to start a session on the **X.Org** display server from the same or another computer.

Additional limitations

The following additional limitations related to the **Wayland** protocol should be noted:

- **X.Org** screen manipulation utilities are not available.
- The **xrandr** utility is not supported because **Wayland** handles layout, rotations, and resolutions differently.
- **GNOME Shell** cannot be restarted using the **Alt**+**F2 r** shortcut.
- Due to stability issues, using **X.org** instead of **Wayland** is recommended in virtual environments.
- **Wayland** does not support the custom or niche input devices that cannot be handled by the **libinput** driver.

2.3. ADDITIONAL RESOURCES

- You can find the current list of environments for which Wayland is not available in the **/usr/lib/udev/rules.d/61-gdm.rules** file.
- For additional information on the **Wayland** project, see Wayland documentation.

CHAPTER 3. REGISTERING THE SYSTEM FOR UPDATES USING GNOME

You must register your system in order to get software updates for your system.

This section explains how you can register your system using GNOME.

Prerequisites

- A valid account with Red Hat customer portal
  See the Create a Red Hat Login page for new user registration.
- Activation Key or keys, if you are registering the system with activation key
- A registration server, if you are registering system using the registration server

3.1. REGISTERING A SYSTEM USING RED HAT ACCOUNT ON GNOME

Follow the steps in this procedure to enroll your system with your Red Hat account.

Prerequisites

- A valid account on Red Hat customer portal.
  See the Create a Red Hat Login page for new user registration.

Procedure

1. Go to the **system menu**, which is accessible from the top-right screen corner and click the **Settings** icon.
2. In the **Details** → **About** section, click **Register**.
3. Select **Registration Server**.
4. If you are not using the Red Hat server, enter the server address in the **URL** field.
5. In the **Registration Type** menu, select **Red Hat Account**.
6. Under **Registration Details**:
   - Enter your Red hat account user name in the **Login** field,
   - Enter your Red hat account password in the **Password** field.
   - Enter the name of your organization in the **Organization** field.
7. Click **Register**.

3.2. REGISTERING A SYSTEM USING AN ACTIVATION KEY ON GNOME

Follow the steps in this procedure to register your system with an activation key. You can get the activation key from your organization administrator.

Prerequisites

- Activation key or keys.
  See the Activation Keys page for creating new activation keys.

Procedure

1. Go to the **system menu**, which is accessible from the top-right screen corner and click the **Settings** icon.
2. In the **Details** → **About** section, click **Register**.
3. Select **Registration Server**.
4. Enter **URL** to the customized server, if you are not using the Red Hat server.
5. In the **Registration Type** menu, select **Activation Keys**.
6. Under **Registration Details**:
   - Enter **Activation Keys**.
     Separate multiple keys by a comma (,).
   - Enter the name or ID of your organization in the **Organization** field.
7. Click **Register**

3.3. UNREGISTERING THE SYSTEM USING GNOME

Follow the steps in this procedure to unregister your system. After unregistering, your system no longer receives software updates.

Procedure

1. Go to the **system menu**, which is accessible from the top-right screen corner and click the **Settings** icon.
2. In the **Details** → **About** section, click **Details**.
   The **Registration Details** screen appears.
3. Click **Unregister**.
   A warning appears about the impact of unregistering the system.
4. Click **Unregister**.

Additional resources

- Registering the system and managing subscription using the command line or web console
- Creating Red Hat Customer Portal Activation Keys
- Understanding Activation Keys
- Registering Systems with Activation keys

CHAPTER 4. CONFIGURING GNOME AT LOW LEVEL

4.1. INTRODUCTION TO CONFIGURING GNOME

To be able to configure the GNOME Desktop Environment, you need to understand these basic terms:

- dconf
- GSettings
- gsettings

dconf has two different meanings.

Firstly, **dconf** is a key-based Binary Large Object (BLOB) database for storing GNOME configurations. **dconf** manages user settings such as GDM, application, and proxy settings, and serves as the back end for **GSettings**.

Secondly, **dconf** is a command-line utility which is used for reading and writing individual values or entire directories from and to a dconf database.

GSettings is a high-level API for application settings which serves as the front end for dconf.

gsettings is a command-line tool which is used to view and change user settings.

4.2. MANAGING USER AND SYSTEM GNOME SETTINGS

dconf allows system administrators and users several levels of control over GNOME configuration:

- Administrators can define default settings that apply to all users.
- Users can override the defaults with their own settings.
- Administrators can also lock settings to prevent users from overriding them.

4.3. DISPLAYING GSETTINGS VALUES FOR DESKTOP APPLICATIONS

Viewing and editing of the **GSettings** values can be achieved with one of the following tools:

- dconf-editor GUI tool
- gsettings command-line utility

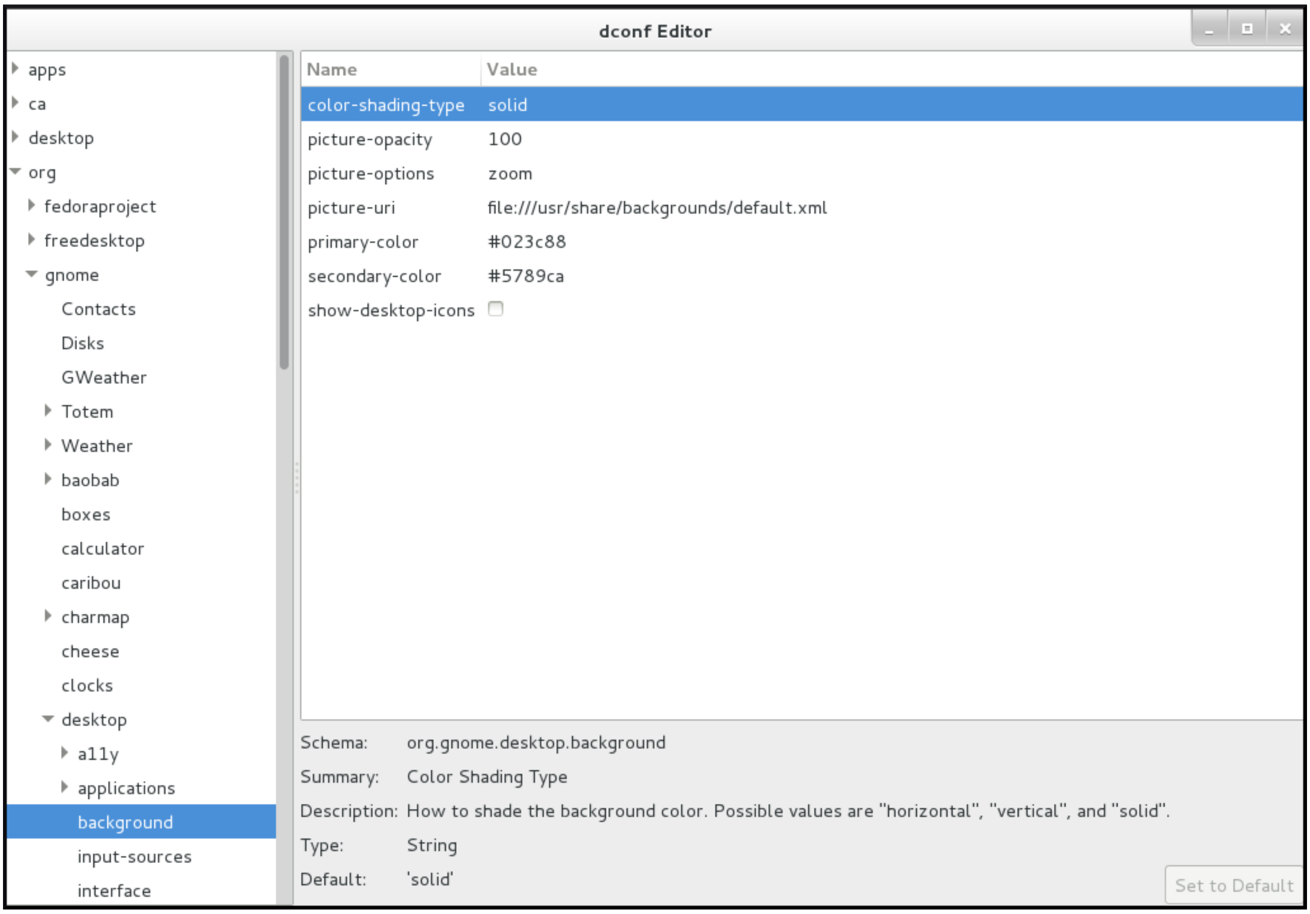
The **dconf-editor** application and **gsettings** utility have the following in common:

- allow browsing and changing options for system and application preferences
- allow to change preferences
- can be run by regular users, because both tools are intended to browse and modify the current user's GSettings database

The **dconf-editor** provides a GUI for browsing the settings and their editing. It presents the hierarchy of settings in a tree-view and also displays additional information about each setting, including the description, type and default value.

The **gsettings** utility can be used to display and set dconf values. **gsettings** utility supports Bash completion for commands and settings. This tools also allows you to automate configuration in shell scripts.

Figure 4.1. dconf-editor showing org.gnome.destop.background GSettings keys



Name	Value
color-shading-type	solid
picture-opacity	100
picture-options	zoom
picture-uri	file:///usr/share/backgrounds/default.xml
primary-color	#023c88
secondary-color	#5789ca
show-desktop-icons	□

Schema: org.gnome.desktop.background
Summary: Color Shading Type
Description: How to shade the background color. Possible values are "horizontal", "vertical", and "solid".
Type: String
Default: 'solid'

Prerequisites

- The **dconf-editor** is not installed on the system by default. To install it, run the following command as the **root** user:

```
~]# yum install dconf-editor
```

Procedure

- To list GSettings values in the GUI, open the **dconf-editor** application.
- To list a specific GSettings value on the command line, use the following command:

```
$ gsettings get schema key
```

For example:

```
$ gsettings get org.gnome.desktop.background picture-uri
```

Additional resources

- For more information on the **dconf-editor** tool, see the **dconf-editor(1)** man page and the dconf-editor Project documentation.

- For more information on the **gsettings** utility, see the **gsettings(1)** man page.

4.4. USING DCONF PROFILES

The dcoonf system stores configuration in several different databases. You can configure dconf profiles, which specify the databases that dconf uses.

4.4.1. Introduction to dconf profiles

A dconf profile is a list of system's hardware and software configuration databases, which the dconf system collects.

The dconf profiles allow you to compare identical systems to troubleshoot hardware or software problems.

The dconf system stores its profiles in the text files which can be located either within the **/etc/dconf/profile/** directory or elsewhere. The **$DCONF_PROFILE** environment variable can specify a relative path to the file from **/etc/dconf/profile/**, or an absolute path, such as in a user's home directory.

Note that key pairs which are set in a dconf profile override the default settings.

4.4.2. Selecting a dconf profile

On startup, **dconf** consults the **$DCONF_PROFILE** environment to find the name of the dconf profile to open. The result depends on whether the variable is set or not:

- If set, **dconf** attempts to open the profile named in the variable and aborts if this step fails.

- If not set, **dconf** attempts to open the profile named **user** and uses an internal hard-wired configuration if this step fails.

Each line in a dconf profile specifies one dconf database.

The first line indicates the database used to write changes. The remaining lines show read-only databases.

The following is a sample profile stored in **/etc/dconf/profile/user**:

```
user-db:user
system-db:local
system-db:site
```

In this example, the dconf profile specifies three databases. **user** is the name of the user database which can be found in **~/.config/dconf**, and **local** and **site** are system databases, located in **/etc/dconf/db/**.

NOTE

To apply a new dconf user profile to the user's session, you need to log out and log in, because the dconf profile for a session is determined at login.

WARNING

As a user or application developer, do not manipulate dconf directly. To manipulate dconf, always use the **dconf-editor** or the **gsettings** utility. The only exception to use dconf directly is when setting system-wide default configurations, because the aforementioned tools do not allow to manipulate such configurations.

4.5. CONFIGURING CUSTOM DEFAULT VALUES

Machine-wide default settings can be set by providing a default for a key in a dconf profile. These defaults can be overridden by the user.

Prerequisites

- the user profile exists
- the value for the key was added to a dconf database

Procedure

For example, to set the default background:

1. Create the user profile in **/etc/dconf/profile/user**:

   ```
   user-db:user
   system-db:local
   ```

   where **local** is the name of a dconf database.

2. Create a keyfile for the local database in **/etc/dconf/db/local.d/01-background**, which contains the following default settings:

   ```
   ~]# dconf path

   [org/gnome/desktop/background]

   # GSettings key names and their corresponding values
   picture-uri='file:///usr/local/share/backgrounds/wallpaper.jpg'
   picture-options='scaled'
   primary-color='000000'
   secondary-color='FFFFFF'
   ```

   In the default setting of the keyfile, the following GSettings keys are used:

   Table 4.1. org.gnome.desktop.background schemas GSettings Keys

Key Name	Possible Values	Description

Key Name	Possible Values	Description
picture-options	"none", "wallpaper", "centered", "scaled", "stretched", "zoom", "spanned"	Determines how the image set by wallpaper_filename is rendered.
picture-uri	filename with the path	URI to use for the background image. Note that the backend only supports local **file://** URIs.
primary-color	default: 000000	Left or Top color when drawing gradients, or the solid color.
secondary-color	default: FFFFFF	Right or Bottom color when drawing gradients, not used for solid color.

3. Edit the keyfile according to your preferences.
   For more information, see Section 4.3, “Displaying GSettings values for desktop applications” .

4. Update the system databases:

```
~]# dconf update
```

When the user profile is created or changed, the user needs to log out and log in again before the changes will be applied.

Additional resources

- If you want to avoid creating a user profile, you can use the **dconf** command-line utility to read and write individual values or entire directories from and to a dconf database. For more information, see the **dconf(1)** man page.

4.6. LOCKING DOWN SPECIFIC SETTINGS

By using the lockdown mode in dconf, you can prevent users from changing specific settings.

Without enforcing the system settings using a lockdown, any settings that users make take precedence over the system settings. User can thus override the system settings with their own.

Procedure

To lock down a GSettings key:

1. Create a locks subdirectory in the keyfile directory such as **/etc/dconf/db/local.d/locks/**.

2. Add any number of files with keys that you want to lock into this directory.

> **Example 4.1. Locking the settings for the default wallpaper**
>
> 1. Set a default wallpaper.
>
> 2. Create a new **/etc/dconf/db/local.d/locks/** directory.

3. Create a new file in **/etc/dconf/db/local.d/locks/00-default-wallpaper** with the following contents, listing one key per line:

```
# Prevent users from changing values for the following keys:
/org/gnome/desktop/background/picture-uri
/org/gnome/desktop/background/picture-options
/org/gnome/desktop/background/primary-color
/org/gnome/desktop/background/secondary-color
```

4. Update the system databases:

```
~]# dconf update
```

4.7. STORING USER SETTINGS OVER NFS

For **dconf** to work correctly when using Network File System (NFS) home directories, the **dconf keyfile back end** must be used.

Note that **dconf keyfile back end**only works properly if the **glib2-fam** package is installed. Without this package, notifications on configuration changes made on remote machines are not displayed properly.

With Red Hat Enterprise Linux 8, **glib2-fam** is available in the BaseOs repository.

To set the **dconf keyfile back end**

1. Ensure that the **glib2-fam** package is installed on the system.
   To verify whether the package is installed on the system:

```
~]#  yum list installed
```

   If **glib2-fam** is not in the list of installed packages, install it by running:

```
~]# yum install glib2-fam
```

2. Create or edit the **/etc/dconf/profile/user** file on every client.

3. At the very beginning of **/etc/dconf/profile/user file**, add the following line:

```
service-db:keyfile/user
```

The **dconf keyfile back end**takes effect the next time that the user logs in. It polls the keyfile to determine whether updates have been made, so settings may not be updated immediately.

4.8. SETTING GSETTINGS KEYS PROPERTIES

This section describes how to set GSettings keys properties for a single-logged user.

Each GSettings key can have only one value in a dconf database. Setting the same key to a different value at a different place of the dconf database overrides the previous value.

Values of some keys are of array type. For array type, you can specify the value of the key as a list of multiple elements separated by a comma.

To set a GSettings key of array type, follow this syntax:

```
key=['option1', 'option2']
```

The following example shows setting of the **org.gnome.desktop.input-sources.xkb-options GSettings** key whose value is of array type:

Example settings of the org.gnome.desktop.input-sources.xkb-options GSettings Key

```
[org/gnome/desktop/input-sources]
# Enable Ctrl-Alt-Backspace for all users
# Set the Right Alt key as the Compose key and enable it
xkb-options=['terminate:ctrl_alt_bksp', 'compose:ralt']
```

4.9. WORKING WITH GSETTINGS KEYS ON COMMAND LINE

This section focuses on using of the **gsettings** command to configure, manipulate and manage the GSettings keys. The most frequent use cases that can be resolved by using the **gsettings** command are shown.

4.9.1. Setting key value

To set a value of a key:

```
gsettings set SCHEMA [:PATH] KEY
```

Note that the value is specified as a serialised GVariant.

Example 4.2. Adding selected applications into the favorite applications key

To add selected applications among your favorite applications:

```
$ gsettings set org.gnome.shell favorite-apps "['firefox.desktop', 'evolution.desktop',
'rhythmbox.desktop', 'shotwell.desktop', 'org.gnome.Nautilus.desktop',
'org.gnome.Software.desktop', 'yelp.desktop', 'org.gnome.Terminal.desktop',
'org.gnome.clocks.desktop']"
```

If the operation succeeds, no return code is shown. As a result, all listed applications are added to favorite applications. The change is valid immediately.

4.9.2. Monitoring key changes

To monitor a key for changes and print values that changed:

```
gsettings monitor SCHEMA [:PATH] [KEY]
```

Note that if the KEY argument is not specified, all keys in the schema are monitored. Monitoring continues until the process is terminated.

Example 4.3. Monitoring changes of the favorite applications key

To monitor the changes of the **favorite applications** key, open two terminals and run:

In the first terminal:

```
$ gsettings monitor org.gnome.shell favorite-apps
```

In the second terminal:

```
$ gsettings set org.gnome.shell favorite-apps "['firefox.desktop', 'evolution.desktop',
'rhythmbox.desktop', 'shotwell.desktop', 'org.gnome.Nautilus.desktop',
'org.gnome.Software.desktop', 'yelp.desktop', 'org.gnome.Terminal.desktop']"
```

As a result, a notification whether and how **favorite applications** changed is displayed in the first terminal:

```
favorite-apps: ['firefox.desktop', 'evolution.desktop', 'rhythmbox.desktop', 'shotwell.desktop',
'org.gnome.Nautilus.desktop', 'org.gnome.Software.desktop', 'yelp.desktop',
'org.gnome.Terminal.desktop']
```

4.9.3. Checking whether key is writable

To check whether a key is writable:

```
gsettings writable SCHEMA [:PATH] KEY
```

Example 4.4. Checking whether the favorite applications key is writable

To check whether the **favorite applications** key is writable:

```
$ gsettings writable org.gnome.shell favorite-apps
```

As a result, the return code shows **True**.

4.9.4. Checking key valid values

To check the range of valid values for a key:

```
gsettings range SCHEMA [:PATH] KEY
```

Example 4.5. Checking the range of valid values for the remember-mount-password key

To check valid values for the **remember-mount-password key**:

```
$ gsettings range org.gnome.shell remember-mount-password
```

As a result, the return code displays type of the key value, which is **type b** in this particular case. For more information, see GNOME developer.

4.9.5. Checking description of valid key values

To check the description of valid values for a key:

```
gsettings describe SCHEMA [:PATH] KEY
```

Example 4.6. Checking the description of valid values for the picture-uri key

To check the description of valid values for the **picture-uri** key:

```
$ gsettings describe org.gnome.desktop.screensaver picture-uri
```

As a result, the following output is displayed:

```
URI to use for the background image. Note that the backend only supports local file:// URIs.
```

4.9.6. Querying key value

To get the value of a key:

```
gsettings get SCHEMA [:PATH] KEY VALUE
```

Note that the value is displayed as a serialised GVariant.

Example 4.7. Querying value of the remember-mount-password key

To get value of the **remember-mount-password** key:

```
$ gsettings get org.gnome.shell remember-mount-password
```

As a result, the return code displays **false**.

4.9.7. Resetting key value

To reset the value of a key:

```
gsettings reset SCHEMA [:PATH] KEY
```

If resetting succeeds, no return code is displayed. Default values are in stored dconf and gsettings-desktop-schemas files.

Example 4.8. Resetting the lock-delay key to its default value

The default value of the **lock-delay** key is 0, and it is stored in the **/usr/share/glib-2.0/schemas/org.gnome.desktop.screensaver.gschema.xml** file.

Users can set the value of **lock-delay** as needed.

For example, to set the **lock-delay** key for screensaver to 200:

```
$ gsettings set org.gnome.desktop.screensaver lock-delay 200
```

To reset the **lock-delay** key for screensaver to its default value:

```
$ gsettings reset org.gnome.desktop.screensaver lock-delay
```

As a result, the value of **lock-delay** value is set to 0.

4.9.8. Resetting schema

To reset a schema:

```
gsettings reset-recursively SCHEMA [:PATH]
```

Example 4.9. Resetting the org.gnome.desktop.screensaver schema to its defaults

To reset the **org.gnome.desktop.screensaver** schema to its defaults:

```
$ gsettings reset-recursively org.gnome.desktop.screensaver
```

As a result, the **lock-delay** value is reset to 0, and other keys within the **org.gnome.desktop.screensaver** schema that were changed by user are reset to their defaults as well.

4.9.9. Listing installed non-relocatable schemas

To list installed schemas that are non-relocatable:

```
gsettings list-schemas [--print-paths]
```

If the **[--print-paths]** argument is specified , the path where each schema is mapped is printed as well.

Example 4.10. Listing installed non-relocatable schemas

To list all schemas installed on your system that are non-relocatable:

```
$ gsettings list-schemas
```

As a result, a full list of schemas is returned. The following list is truncated.

```
org.gnome.rhythmbox.library
org.gnome.shell.overrides
org.gnome.system.proxy.https
org.gnome.clocks
org.gnome.eog.fullscreen
org.gnome.login-screen
org.gnome.eog.view
```

4.9.10. Listing schema keys

To list the keys that are in the selected schema:

```
gsettings list-keys SCHEMA [:PATH]
```

Example 4.11. Listing keys in the org.gnome.shell schema

To list keys in the **org.gnome.shell** schema:

```
$ gsettings list-keys org.gnome.shell
```

As a result, a list of keys is returned. The following list is truncated.

```
enabled-extensions
command-history
remember-mount-password
always-show-log-out
had-bluetooth-devices-setup
looking-glass-history
disable-user-extensions
app-picker-view
disable-extension-version-validation
development-tools
favorite-apps
```

4.9.11. Listing schema children

To list children of a selected schema:

```
gsettings list-children SCHEMA [:PATH]
```

Note that the list is empty if there are no children.

Example 4.12. Listing children of the org.gnome.shell schema

To list children of the **org.gnome.shell** schema:

```
$ gsettings list-children org.gnome.shell
```

As a result, the following output is returned:

```
keyboard org.gnome.shell.keyboard
keybindings org.gnome.shell.keybindings
```

4.9.12. Listing schema’s keys and values

To list keys and values of a selected schema recursively:

```
gsettings list-recursively [SCHEMA [:PATH]]
```

Note that if the schema whose keys you want to list is not specified, all keys within all schemas are listed.

Example 4.13. Listing keys and values recursively

To list keys and values in all schemas recursively:

```
$ gsettings list-recursively
```

As a result, all key and values in all schemas on system are listed, as shown below. Note that the following list is truncated.

```
org.gnome.nautilus.desktop network-icon-visible false
org.gnome.nautilus.desktop font ''
org.gnome.nautilus.desktop network-icon-name 'Network Servers'
org.gnome.nautilus.desktop home-icon-name 'Home'
org.gnome.nautilus.desktop volumes-visible true
org.gnome.Vinagre always-enable-listening false
org.gnome.Vinagre always-show-tabs false
org.gnome.Vinagre show-accels false
org.gnome.Vinagre history-size 15
org.gnome.Vinagre shared-flag true
```

4.10. ACKNOWLEDGEMENTS

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CHAPTER 5. CONFIGURING FILE ASSOCIATIONS

This section provides information on configuring RHEL to open or access files with different formats.

In GNOME, MIME (Multipurpose Internet Mail Extension) types help to identify the format of a file and applications to use to open these files.

5.1. MULTIPURPOSE INTERNET MAIL EXTENSION TYPES

The GNOME desktop uses MIME types to:

- Determine which application should open a specific file format by default.
- Register other applications that can open files of a specific format.
- Set a string describing the type of a file, for example, in a file properties dialog of the files application.
- Set an icon representing a specific file format, for example, in a file properties dialog of the files application.

MIME type names follow a given format:

```
media-type/subtype-identifier
```

For example, **image/jpeg**.

Here **image** is a media type and **jpeg** is the subtype identifier.

GNOME follows Multipurpose Internet Mail Extension (MIME) info specification from the *Freedesktop.org* to determine:

- The machine-wide and user-specific location to store all the MIME type specification files.
- How to register a MIME type so that the desktop environment knows which application you can use to open a specific file format.
- How users can change which applications should open with what file formats.

MIME database

The MIME database is a collection of all the MIME type specification files that GNOME uses to store information about known MIME types.

The most important part of the MIME database from the system administrator's point of view is the **/usr/share/mime/packages/** directory, where the MIME type-related files specifying information on known MIME types are stored. One example of such a file is **/usr/share/mime/packages/freedesktop.org.xml**, specifying information about the standard MIME types available on the system, by default. The shared-mime-info package provides this file.

Additional resources

- For detailed information describing the MIME type system, see Shared MIME Info specifications on the Freedesktop website.

5.2. ADDING A CUSTOM MIME TYPE FOR ALL USERS

You must create a new MIME type specification file in the **/usr/share/mime/packages/** directory and a **.desktop** file in the **/usr/share/applications/** directory to add a custom MIME type for all the users on the system and register a default application for that MIME type.

Procedure

1. Create the **/usr/share/mime/packages/application-x-newtype.xml** file with following content:

```
<?xml version="1.0" encoding="UTF-8"?>

<mime-info xmlns="http://www.freedesktop.org/standards/shared-mime-info">
  <mime-type type="application/x-newtype">
    <comment>new mime type</comment>
    <glob pattern="*.xyz"/>
  </mime-type>
</mime-info>
```

The sample application-x-newtype.xml file here defines a new MIME type application/x-newtype and assigns file names with the .xyz extension to that MIME type.

2. Create a new **.desktop** file named, for example, **myapplication1.desktop** in the **/usr/share/applications/** with following content:

```
[Desktop Entry]
Type=Application
MimeType=application/x-newtype
Name=My Application 1
Exec=myapplication1
```

The sample **myapplication1.desktop** file here associates the **application/x-newtype** MIME type with an application named **My Application 1**. It is run by a command **myapplication1**.

3. As a root user, update the MIME database for your changes to take effect.

```
# update-mime-database /usr/share/mime
```

4. As a root user, update the application database.

```
# update-desktop-database /usr/share/applications
```

Verification steps

1. To verify that you have successfully associated ***.xyz** files with the **application/x-newtype** MIME type, first create an empty file, for example test.xyz and execute the following commands:

```
$ touch test.xyz

$ gvfs-info test.xyz | grep "standard::content-type"
  standard::content-type: application/x-newtype
```

2. To verify **myapplication1.desktop** is correctly set as the default registered application for the **application/x-newtype** MIME type, execute following command:

```
$ gio mime --query application/x-newtype
```

```
Default application for 'application/x-newtype': myapplication1.desktop
Registered applications:
 myapplication1.desktop
Recommended applications:
 myapplication1.desktop
```

5.3. ADDING A CUSTOM MIME TYPE FOR INDIVIDUAL USERS

You must create a new MIME type specification file in the **~/.local/share/mime/packages/** directory and a **.desktop** file in the **~/.local/share/applications/** directory to add a custom MIME type for individual users and register a default application for that MIME type.

Procedure

1. Create the **~/.local/share/mime/packages/application-x-newtype.xml** file with following content:

   ```
   <?xml version="1.0" encoding="UTF-8"?>
   <mime-info xmlns="http://www.freedesktop.org/standards/shared-mime-info">
     <mime-type type="application/x-newtype">
       <comment>new mime type</comment>
       <glob pattern="*.xyz"/>
     </mime-type>
   </mime-info>
   ```

   The sample **application-x-newtype.xml** file here defines a new MIME type **application/x-newtype** and assigns file names with the **.xyz** extension to that MIME type.

2. Create a new .desktop file named, for example, **myapplication1.desktop**, and place it in the **~/.local/share/applications/** directory with following content:

   ```
   [Desktop Entry]
   Type=Application
   MimeType=application/x-newtype
   Name=My Application 1
   Exec=myapplication1
   ```

   The sample **myapplication1.desktop** file above associates the **application/x-newtype** MIME type with an application named My Application 1. It is run by a command **myapplication1**.

3. Update the MIME database for your changes to take effect:

   ```
   $ update-mime-database ~/.local/share/mime
   ```

4. Update the application database:

   ```
   $ update-desktop-database ~/.local/share/applications
   ```

Verification steps

1. To verify that you have successfully associated ***.xyz** files with the **application/x-newtype** MIME type, first create an empty file, for example, test.xyz and execute the following commands:

```
$ touch test.xyz

$ gvfs-info test.xyz | grep "standard::content-type"
  standard::content-type: application/x-newtype
```

2. To verify that **myapplication1.desktop** is correctly set as the default registered application for the **application/x-newtype** MIME type, execute following command:

```
$ gio mime --query application/x-newtype
Default application for 'application/x-newtype': myapplication1.desktop
Registered applications:
 myapplication1.desktop
Recommended applications:
 myapplication1.desktop
```

5.4. OPTIONS TO OVERRIDE DEFAULT MIME TYPES

By default, the package-installed **/usr/share/applications/mimeapps.list** and **/usr/share/applications/gnome-mimeapps.list** files specify which application is registered to open specific MIME types.

System administrators can create the **/etc/xdg/mimeapps.list** or **/etc/xdg/gnome-mimeapps.list** file with a list of MIME types they want to override with the default registered application.

Local users can create the **~/.local/share/applications/mimeapps.list** or **~/.local/share/applications/gnome-mimeapps.list** file with a list of MIME types for which they want to override the default registered application.

Configurations are applied in the following order:

1. **/usr/share/applications/**

2. **/etc/xdg/**

3. **~/.local/share/application/**

Within a particular location, the configurations are applied in the following order:

1. mimeapps.list

2. gnome-mimeapps.list

5.5. OVERRIDING DEFAULT REGISTERED APPLICATION FOR ALL THE USERS

As a system administer, you can update the configuration based on the requirements. System administrator’s configuration takes precedence over default package configuration. Within each, the desktop-specific configuration takes precedence over the configuration that does not specify the desktop environment.

Procedure

1. Consult the **/usr/share/applications/mimeapps.list** file to determine the MIME types for which you want to change the default registered application. For example, the following sample of the

mimeapps.list file specifies the default registered application for the **text/html** and **application/xhtml+xml** MIME types:

```
[Default Applications]
text/html=firefox.desktop
application/xhtml+xml=firefox.desktop
```

This example above specifies default application (Firefox) by specifying its corresponding **.desktop** file (**firefox.desktop**). You can find **.desktop** files for other applications in the **/usr/share/applications/** directory.

2. Create the **/etc/xdg/mimeapps.list** file and specify the MIME types and their corresponding default registered applications in this file.

```
[Default Applications]
text/html=myapplication1.desktop
application/xhtml+xml=myapplication2.desktop
```

This example above sets the default registered application for the **text/html** MIME type to **myapplication1.desktop** and **application/xhtml+xml** MIME type to **myapplication2.desktop**.

Verification steps

- For these settings to function correctly, ensure that both the **myapplication1.desktop** and **myapplication2.desktop** files are placed in the **/usr/share/applications/** directory.

- Execute the **gio mime query** command to verify that the default registered application is set correctly.

```
$ gio mime text/html
Default application for 'text/html': myapplication1.desktop
Registered applications:
 myapplication1.desktop
 firefox.desktop
Recommended applications:
 myapplication1.desktop
 firefox.desktop
```

5.6. OVERRIDING DEFAULT REGISTERED APPLICATION FOR INDIVIDUAL USERS

Individual users can also update the configuration based on the requirements. This configuration takes precedence over the system administrator’s configuration and the system administrator’s configuration takes precedence over the package configuration. Within each, the desktop-specific configuration takes precedence over the configuration that does not specify the desktop environment.

Procedure

1. Consult the **/usr/share/applications/mimeapps.list** file to determine the MIME types for which you want to change the default registered application. For example, the following sample of the **mimeapps.list** file specifies the default registered application for the **text/html** and **application/xhtml+xml** MIME types:

```
[Default Applications]
text/html=firefox.desktop
application/xhtml+xml=firefox.desktop
```

This example above specifies default application (Firefox) by specifying its corresponding **.desktop** file (**firefox.desktop**). You can find **.desktop** files for other applications in the **/usr/share/applications/** directory.

2. Create the **~/.local/share/applications/mimeapps.list** file and specify the MIME types and their corresponding default registered applications in this file.

```
[Default Applications]
text/html=myapplication1.desktop
application/xhtml+xml=myapplication2.desktop
```

This example above sets the default registered application for the **text/html** MIME type to **myapplication1.desktop** and **application/xhtml+xml** MIME type to **myapplication2.desktop**.

Verification steps

- For these settings to function correctly, ensure that both the **myapplication1.desktop** and **myapplication2.desktop** files are placed in the **/usr/share/applications/** directory.

- Execute the **gio mime query** command to verify that the default registered application is set correctly.

```
$ gio mime text/html
Default application for 'text/html': myapplication1.desktop
Registered applications:
 myapplication1.desktop
 firefox.desktop
Recommended applications:
 myapplication1.desktop
 firefox.desktop
```

CHAPTER 6. CUSTOMIZING DESKTOP APPEARANCE

This section explains how system administrators can customize appearance of the desktop environment for different users of the system.

6.1. CUSTOMIZING DESKTOP BACKGROUNDS

As a system administrator, you can configure the default desktop background, add extra backgrounds, or add multiple backgrounds using the **dconf** utility.

If the users of the system are not permitted to change background from the defaults, system administrator needs to lock the settings using the **locks** directory. Otherwise, each user can customize the background according to their preferences.

6.1.1. Customizing the default desktop background

You can configure the default desktop background and its appearance by setting the relevant GSettings keys in the **org.gnome.desktop.background** schema.

For more information about **GSettings**, see Section 4.1, "Introduction to configuring GNOME" .

Use the following procedure to set the default background:

Procedure

1. Create a local database for machine-wide settings in **/etc/dconf/db/local.d/00-background**:

```
# Specify the dconf path
[org/gnome/desktop/background]

# Specify the path to the desktop background image file
picture-uri='file:///usr/local/share/backgrounds/wallpaper.jpg'
# Specify one of the rendering options for the background image:
# 'none', 'wallpaper', 'centered', 'scaled', 'stretched', 'zoom', 'spanned'
picture-options='scaled'
# Specify the left or top color when drawing gradients or the solid color
primary-color='000000'
# Specify the right or bottom color when drawing gradients
secondary-color='FFFFFF'
```

2. Optionally, if you want an user to not be able to change the default background, override the user's setting in the **/etc/dconf/db/local.d/locks/background** file:

```
# List the keys used to configure the desktop background
/org/gnome/desktop/background/picture-uri
/org/gnome/desktop/background/picture-options
/org/gnome/desktop/background/primary-color
/org/gnome/desktop/background/secondary-color
```

3. Update the system databases:

```
# dconf update
```

4. Users must log out and back in again before the system-wide settings take effect.

6.1.2. Adding extra backgrounds

You can make extra backgrounds available to users on your system.

Procedure

1. Use the **org.gnome.desktop.background** schemas to create a file in the **xml** format specifying your extra background's appearance.

   Table 6.1. Frequently used org.gnome.desktop.background schemas GSettings Keys

Key Name	Possible Values	Description
picture-options	"none", "wallpaper", "centered", "scaled", "stretched", "zoom", "spanned"	Determines how the image set by wallpaper_filename is rendered.
color-shading-type	"horizontal", "vertical", and "solid"	Determines shade the background color.
primary-color	default: #023c88	Left or Top color when drawing gradients, or the solid color.
secondary-color	default: #5789ca	Right or Bottom color when drawing gradients, not used for solid color.

   The full range of options can be found in the **dconf-editor** GUI or the **gsettings** command-line utility. For more information, see Section 4.3, "Displaying GSettings values for desktop applications".

2. Store the *.xml file under the **/usr/share/gnome-background-properties/** directory.

When an user clicks their name in the top right corner, chooses **Settings**, and in the **Personal** section of the table selects **Background**, they will see the new background available.

Example implementation of org.gnome.desktop.background GSettings keys

An example extra backgrounds file with one **<wallpaper>** element

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE wallpapers SYSTEM "gnome-wp-list.dtd">
<wallpapers>
  <wallpaper deleted="false">
    <name>Company Background</name>
    <name xml:lang="de">Firmenhintergrund</name>
    <filename>/usr/local/share/backgrounds/company-wallpaper.jpg</filename>
    <options>zoom</options>
    <shade_type>solid</shade_type>
    <pcolor>#ffffff</pcolor>
    <scolor>#000000</scolor>
  </wallpaper>
</wallpapers>
```

In one configuration file, you can specify multiple **<wallpaper>** elements to add more backgrounds as shown in the following example with two **<wallpaper>** elements, adding two different backgrounds.

An example extra backgrounds file with two **<wallpaper>** elements

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE wallpapers SYSTEM "gnome-wp-list.dtd">
<wallpapers>
  <wallpaper deleted="false">
    <name>Company Background</name>
    <name xml:lang="de">Firmenhintergrund</name>
    <filename>/usr/local/share/backgrounds/company-wallpaper.jpg</filename>
    <options>zoom</options>
    <shade_type>solid</shade_type>
    <pcolor>#ffffff</pcolor>
    <scolor>#000000</scolor>
  </wallpaper>
  <wallpaper deleted="false">
    <name>Company Background 2</name>
    <name xml:lang="de">Firmenhintergrund 2</name>
    <filename>/usr/local/share/backgrounds/company-wallpaper-2.jpg</filename>
    <options>zoom</options>
    <shade_type>solid</shade_type>
    <pcolor>#ff0000</pcolor>
    <scolor>#00ffff</scolor>
  </wallpaper>
</wallpapers>
```

6.1.3. Setting the screen shield

Screen shield is the screen that quickly slides down when the system is locked. It is controlled by the **org.gnome.desktop.screensaver.picture-uri** GSettings key. GDM uses its own dconf profile, so you can set the default background by changing the settings in that profile.

For more information on **GSettings** and **dconf**, see Section 4.1, “Introduction to configuring GNOME” .

Procedure

1. Create a gdm database for machine-wide settings in **/etc/dconf/db/gdm.d/01-screensaver**:

   ```
   [org/gnome/desktop/screensaver]
   picture-uri='file:///opt/corp/background.jpg'
   ```

   Replace **/opt/corp/background.jpg** with the path to the image file you want to use as the screen shield. Supported formats are PNG, JPG, JPEG, and TGA. Note that the image will be scaled if necessary to fit the screen.

2. Update the system databases:

   ```
   # dconf update
   ```

3. Users must log out and back in again before the system-wide settings take effect.

Troubleshooting

If the screen shield does not update, you can:

1. Make sure that you have updated the system databases by running the **dconf update** command as the **root** user.

2. Try restarting GDM.

6.2. USING GNOME SHELL EXTENSIONS TO CUSTOMIZE DESKTOP ENVIRONMENT

GNOME Shell extensions allow for the customization of the default GNOME Shell interface and its parts, such as window management and application launching.

IMPORTANT

Before deploying third-party GNOME Shell extensions on Red Hat Enterprise Linux, make sure to read the following document to learn about the Red Hat support policy for third-party software:How does Red Hat Global Support Services handle third-party software, drivers, and/or uncertified hardware/hypervisors?

6.2.1. Overview of GNOME Shell extensions

This section provides an overview of GNOME Shell extensions available on RHEL 8, including the name of the package providing a particular extension, and the description of what each extension does.

Table 6.2. Overview of available GNOME Shell extensions

Package name	Extension name	Description
gnome-shell-extension-apps-menu	apps-menu	**Applications** menu for GNOME Shell
gnome-shell-extension-top-icons	Top Icons	Show legacy icons on top
gnome-shell-extension-user-theme	user-theme	Support for custom themes in GNOME Shell
gnome-shell-extension-drive-menu	drive-menu	Drive status menu for GNOME Shell
gnome-shell-extension-window-list	window-list	Display a window list at the bottom of the screen in GNOME Shell
gnome-shell-extension-dash-to-dock	Dash to Dock	Dock for the Gnome Shell by micxgx.gmail.com
gnome-shell-extension-desktop-icons	Desktop Icons	Desktop icons support for the GNOME Classic experience
gnome-shell-extension-no-hot-corner	nohotcorner	Disable the hot corner in GNOME Shell

Package name	Extension name	Description
gnome-shell-extension-systemMonitor	systemMonitor	**System Monitor** for GNOME Shell
gnome-shell-extension-updates-dialog	Updates Dialog	Show a modal dialog when there are software updates
gnome-shell-extension-window-grouper	window-grouper	Keep windows that belong to the same process on the same workspace
gnome-shell-extension-panel-favorites	panel-favorites	Favorite launchers in GNOME Shell's top bar
gnome-shell-extension-windowsNavigator	windowNavigator	Support for keyboard selection of windows and workspaces in GNOME shell
gnome-shell-extension-auto-move-windows	Autom Move Windows	Assign specific workspaces to applications in GNOME Shell
gnome-shell-extension-launch-new-instance	launch-new-instance	Always launch a new application instance for GNOME Shell
gnome-shell-extension-workspace-indicator	workspace-indicator	Workspace indicator for GNOME Shell
gnome-shell-extension-disable-screenshield	Disable Screen Shield	Disable GNOME Shell screen shield if lock is disabled
gnome-shell-extension-native-window-placement	native-window-placement	Native window placement for GNOME Shell
gnome-shell-extension-screenshot-window-sizer	screenshot-window-sizer	Screenshot window sizer for GNOME Shell
gnome-shell-extension-horizontal-workspaces	horizontal-workspaces	Desktop icons support for the GNOME Classic experience
gnome-shell-extension-places-menu	places-menu	**Places** status menu for GNOME Shell
gnome-classic-session	–	GNOME Classic mode session

6.2.2. Enabling machine-wide extensions

Prerequisites

To make extensions available to all users on the system, install them in the **/usr/share/gnome-shell/extensions** directory.

Procedure

1. Create a local database file for machine-wide settings in **/etc/dconf/db/local.d/00-extensions**:

   ```
   [org/gnome/shell]
   # List all extensions that you want to have enabled for all users
   enabled-extensions=['myextension1@myname.example.com',
   'myextension2@myname.example.com']
   ```

   The **enabled-extensions** key specifies the enabled extensions using the extensions' uuid (**myextension1@myname.example.com** and **myextension2@myname.example.com**).

2. Update the system databases:

   ```
   # dconf update
   ```

3. Users must log out and back in again before the system-wide settings take effect.

> **NOTE**
>
> There is currently no way to enable additional extensions for users who have already logged in. This does not apply for existing users who have installed and enabled their own GNOME extensions.

6.2.3. Locking down enabled extensions

You can prevent the user from enabling or disabling extensions by locking down the **org.gnome.shell.enabled-extensions key**.

Procedure

1. Create a local database file for machine-wide settings in **/etc/dconf/db/local.d/00-extensions**:

   ```
   [org/gnome/shell]
   # List all extensions that you want to have enabled for all users
   enabled-extensions=['myextension1@myname.example.com',
   'myextension2@myname.example.com']
   ```

   The **enabled-extensions** key specifies the enabled extensions using the extensions' uuid (**myextension1@myname.example.com** and **myextension2@myname.example.com**).

2. Override the user’s setting and prevent the user from changing it in **/etc/dconf/db/local.d/locks/extensions**:

   ```
   # Lock the list of mandatory extensions
   /org/gnome/shell/enabled-extensions
   ```

3. Update the system databases:

```
# dconf update
```

4. Users must log out and back in again before the system-wide settings take effect.

After locking down the **org.gnome.shell.enabled-extensions**, any extensions installed in **~/.local/share/gnome-shell/extensions** or **/usr/share/gnome-shell/extensions** that are not listed in the **org.gnome.shell.enabled-extensions** key will not be loaded by GNOME Shell, thus preventing the user from using them.

6.2.4. Setting up mandatory extensions

In GNOME Shell, you can provide a set of extensions that the user has to use.

Prerequisites

The extensions must be installed under the **/usr/share/gnome-shell/extensions** directory.

Procedure

1. Create a local database file for machine-wide settings in **/etc/dconf/db/local.d/00-extensions-mandatory**:

```
[org/gnome/shell]
# List all mandatory extensions
enabled-extensions=['myextension1@myname.example.com',
'myextension2@myname.example.com']
```

   The **enabled-extensions** key specifies the enabled extensions using the extensions' uuid (**myextension1@myname.example.com** and **myextension2@myname.example.com**).

2. Override the user's setting and prevent the user from changing it in **/etc/dconf/db/local.d/locks/extensions-mandatory**:

```
# Lock the list of mandatory extensions
/org/gnome/shell/enabled-extensions
```

3. Update the system databases:

```
# dconf update
```

4. Users must log out and back in again before the system-wide settings take effect.

CHAPTER 7. CUSTOMIZING GNOME DESKTOP FEATURES

7.1. CHANGING THE LANGUAGE USING DESKTOP GUI

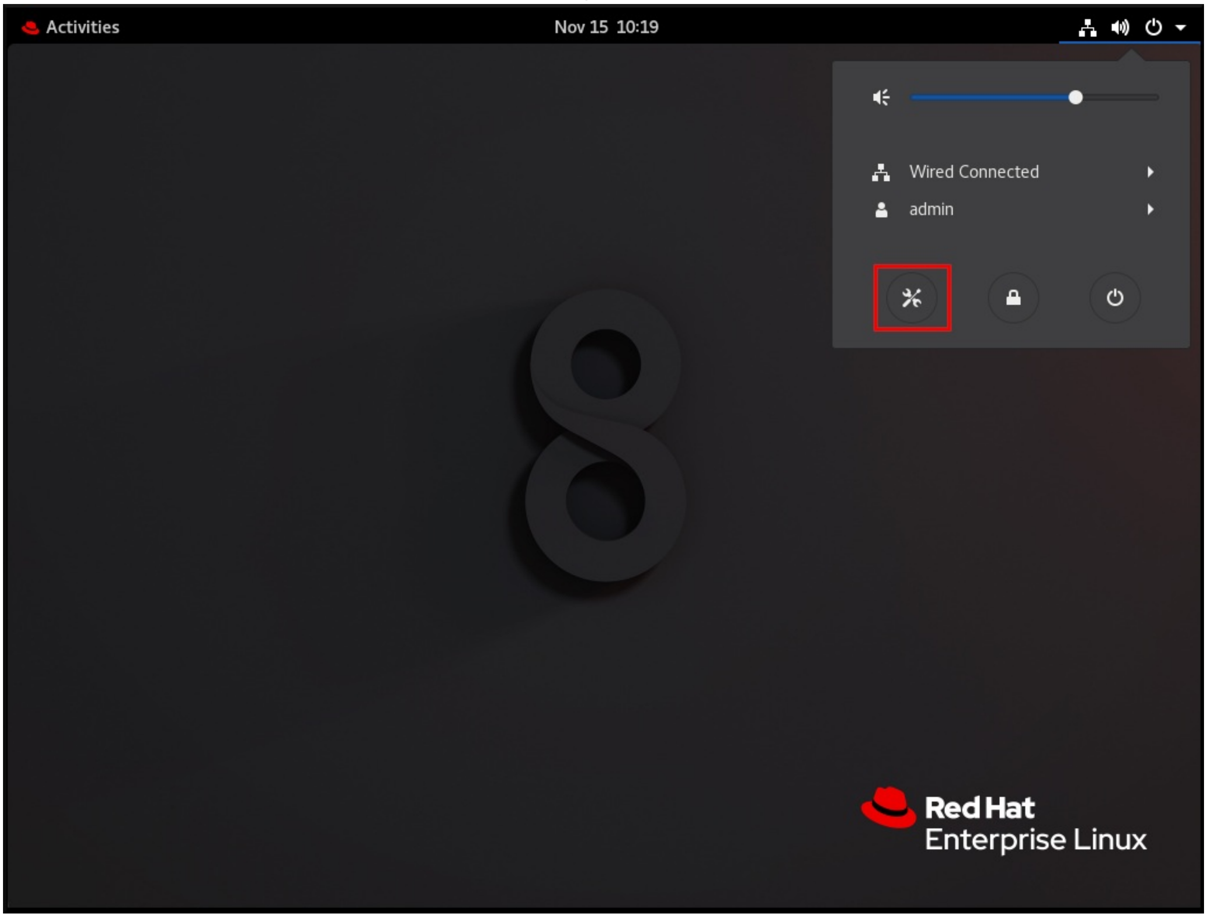
This section describes how to change the system language using the desktop GUI.

Prerequisites

- Required language packages are installed on your system

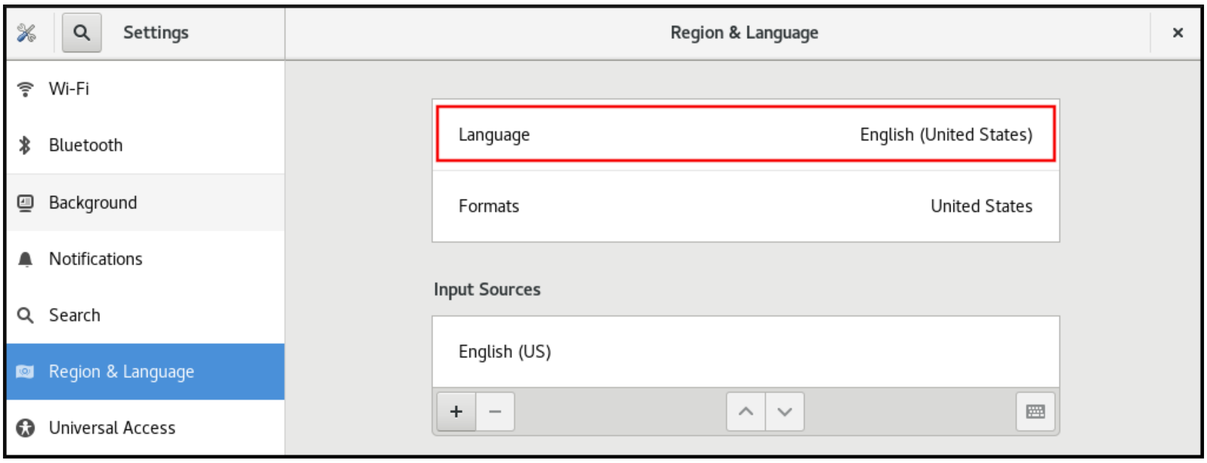
Procedure

1. Open the **GNOME Control Center** from the **System menu** by clicking on its icon.



2. In the **GNOME Control Center**, choose **Region & Language** from the left vertical bar.

3. Click the **Language** menu.



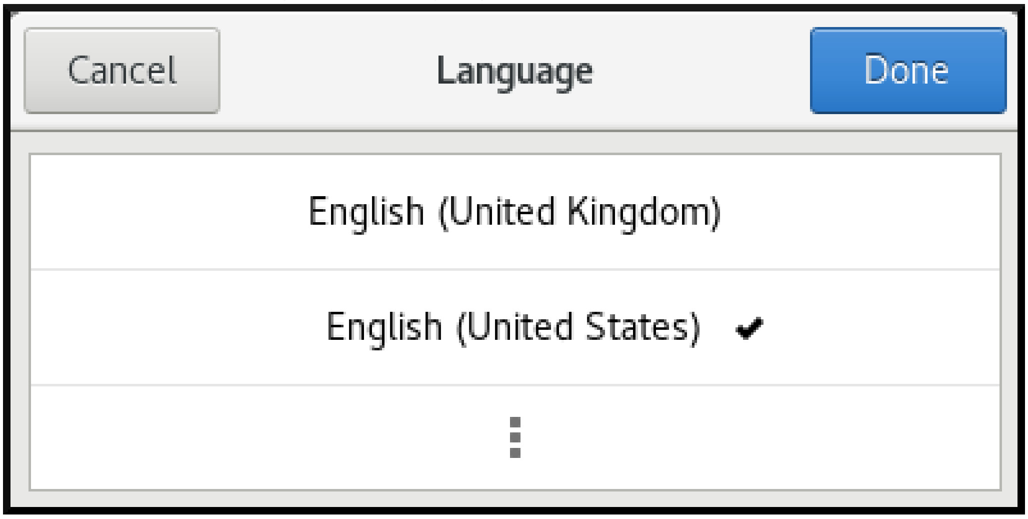
Language English (United States)

Formats United States

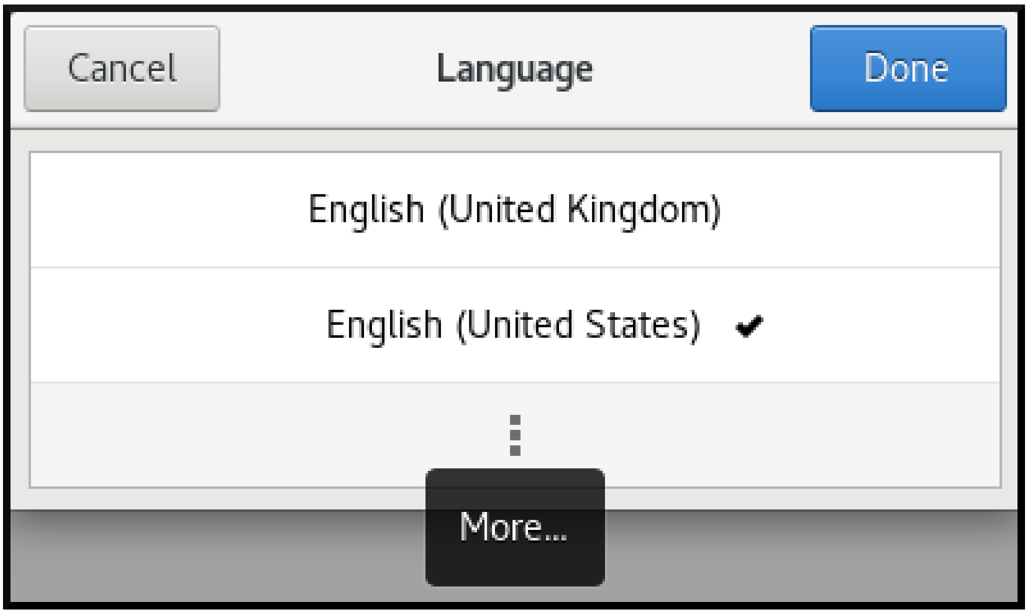
Input Sources

English (US)

4. Select the required region and language from the menu.

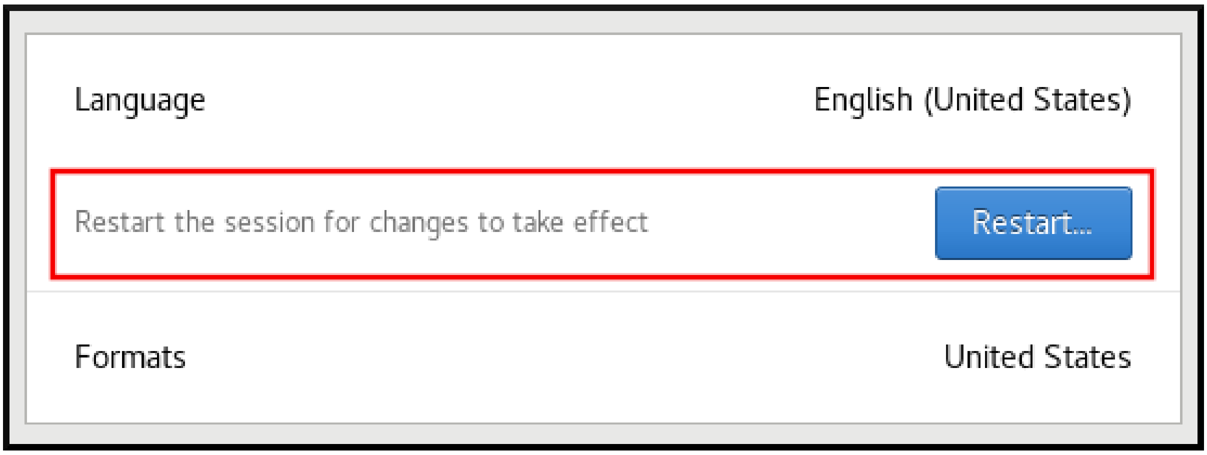


If your region and language are not listed, scroll down, and click **More** to select from available regions and languages.



5. Click **Done**.

6. Click **Restart** for changes to take effect.



Language English (United States)

Restart the session for changes to take effect

Formats United States

NOTE

Some applications do not support certain languages. The text of an application that cannot be translated into the selected language remains in US English.

Additional resources

- For more information on how to launch the **GNOME Control Center**, see approaches described in Launching applications

7.2. ENABLING THE CTRL+ALT+BACKSPACE SHORTCUT

The **Ctrl+Alt+Backspace** shortcut key combination is used for terminating the **X.Org** display server.

You might want to terminate **X.Org** especially when:

- A program caused **X.Org** to stop working.
- You need to switch from your logged-in session quickly.
- You have launched a program that failed.
- You cannot operate in the current session.
- Your screen freezes.

To enable the **Ctrl+Alt+Backspace** shortcut to forcibly terminate **X.Org** by default for all users, you need to set the **org.gnome.desktop.input-sources.xkb-options** GSettings key.

Procedure

1. Create a local database for machine-wide settings in **/etc/dconf/db/local.d/00-input-sources**:

```
[org/gnome/desktop/input-sources]
# Enable Ctrl-Alt-Backspace for all users
xkb-options=['terminate:ctrl_alt_bksp']
```

2. Override the user’s setting, and prevent the user from changing it in **/etc/dconf/db/local.d/locks/input-sources**:

```
# Lock the list of enabled XKB options
/org/gnome/desktop/input-sources/xkb-options
```

3. Update the system databases for the changes to take effect:

```
# dconf update
```

4. Users must log out and back in again before the system-wide settings take effect.

If the **Ctrl+Alt+Backspace** key combination is enabled, all users can terminate **X.Org**, which brings them back to the login prompt.

7.3. DISABLING COMMAND-LINE ACCESS

To disable command-line access for a desktop user, you need to make configuration changes in a number of different contexts:

- Section 7.3.1, "Setting the org.gnome.desktop.lockdown.disable-command-line Key"
- Section 7.3.2, "Disabling virtual terminal switching on X.Org"
- Remove **Terminal** and any other application that provides access to the terminal from the **Applications menu** and **Activities Overview** in GNOME Shell. This is done by removing menu items for those applications.

NOTE

The following steps do not remove the desktop user's permissions to access a command line, but rather remove the ways that the desktop user could access command line.

7.3.1. Setting the org.gnome.desktop.lockdown.disable-command-line Key

This approach prevents the user from:

- Accessing the terminal
- Specifying a command line to be executed by using the **Alt+F2** command prompt

Procedure

1. Create a local database for machine-wide settings in **/etc/dconf/db/local.d/00-lockdown**:

```
[org/gnome/desktop/lockdown]
# Disable command-line access
disable-command-line=true
```

2. Override the user's setting and prevent the user from changing it in **/etc/dconf/db/local.d/locks/lockdown**:

```
# Lock the disabled command-line access
/org/gnome/desktop/lockdown
```

3. Update the system databases:

```
# dconf update
```

4. Users must log out and back in again before the system-wide settings take effect.

7.3.2. Disabling virtual terminal switching on X.Org

With the **X.Org** display server, users can normally use the **Ctrl+Alt+function** key shortcuts to switch from the GNOME Desktop and **X.Org** to a virtual terminal. You can disable access to all virtual terminals by modifying the **X.Org** configuration. The **X.Org** configuration should be modified by adding the **DontVTSwitch** option to the **Serverflags** section of an X configuration file in the **/etc/X11/xorg.conf.d/** directory, as shown by the following procedure.

IMPORTANT

You cannot apply the procedure if **GNOME Shell on Wayland** is used as the display server.

Procedure

1. Create or edit an X configuration file in the **/etc/X11/xorg.conf.d/** directory:

   NOTE

   By convention, these host-specific configuration file names start with two digits and a hyphen and always have the **.conf** extension. Thus, the following file name can be **/etc/X11/xorg.conf.d/10-xorg.conf**.

   ```
   Section "Serverflags"

   Option "DontVTSwitch" "yes"

   EndSection
   ```

2. Restart the **X.Org** display server for the changes to take effect.

7.4. PREVENTING THE COMPUTER FROM SUSPENDING WHEN CLOSING THE LID

When closing the lid of your laptop, the computer by default suspends in order to save power. You can prevent the computer from suspending when closing the lid by changing the setting for that behavior.

WARNING

Some laptops can overheat if they are left running with the lid closed, especially if they are in a confined place. Therefore, consider whether changing the default setting from **suspend** to an other option is beneficial in your case.

Procedure

1. Open the **/etc/systemd/logind.conf** file for editing.
2. Find the **HandleLidSwitch=suspend** line in the file.
   If it is quoted out with the **#** character at the start, unquote it by removing **#**.

   If the line is not present in the file, add it.
3. Replace the default **suspend** parameter with:
   - **lock** for the screen to lock
   - **ignore** for nothing to happen
   - **poweroff** for the computer to switch off
     For example:

     ```
     [Login]
     HandleLidSwitch=lock
     ```
4. Save your changes, and close the editor.
5. Run the following command so that your changes preserve the next restart of the system:

   ```
   # systemctl restart systemd-logind.service
   ```

WARNING

Restarting the service forcibly interrupts any currently running GNOME session of any desktop user who is logged in. This can result in users losing unsaved data.

For more information on the **/etc/systemd/logind.conf** file, see the **logind.conf** man page.

7.5. CHANGING BEHAVIOR WHEN PRESSING THE POWER BUTTON IN GRAPHICAL TARGET MODE

When the machine is booted to a graphical login screen or user session, hitting the **power** button makes the machine suspend by default. This happens both in cases when the user presses the **power** button physically or when pressing a virtual **power** button from a remote console. To achieve a different behavior when pressing the **power** button, set the function of this button with **dconf**.

For example, if you want the system to shutdown after pressing the **power** button, use the following procedure:

Procedure

1. Create a local database for system-wide settings in the **/etc/dconf/db/local.d/01-power** file:

```
[org/gnome/settings-daemon/plugins/power]
power-button-action='interactive'
```

2. Override the user’s setting, and prevent the user from changing it in the **/etc/dconf/db/local.d/locks/01-power** file:

   ```
   /org/gnome/settings-daemon/plugins/power/power-button-action
   ```

3. Update the system databases:

   ```
   # dconf update
   ```

4. Log out and back in again before the system-wide settings take effect.

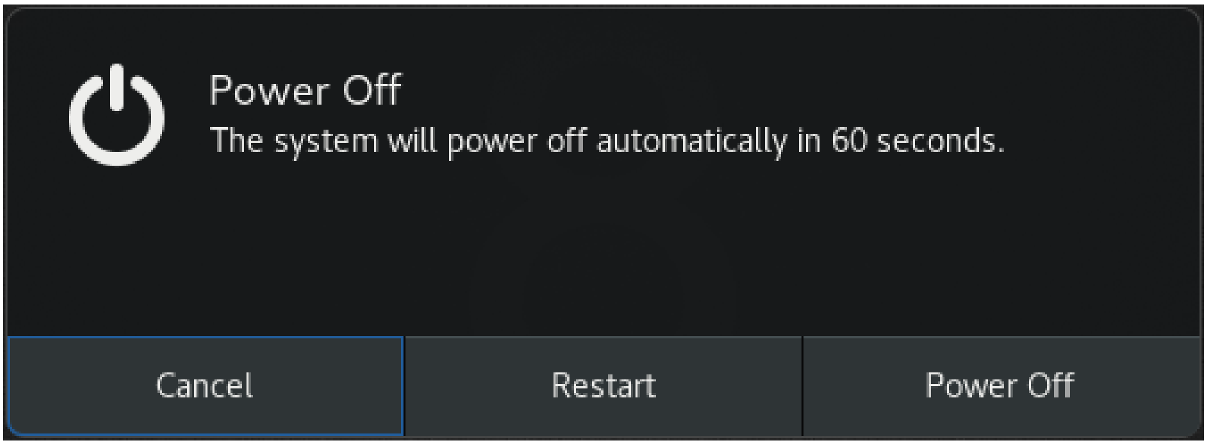
This configuration initiates a system shutdown after pressing the **power** button. To configure the system differently, you can set the behavior of particular buttons.

Options for particular buttons:

- nothing
  does nothing
- suspend
  suspends the system
- hibernate
  hibernates the system
- interactive
  shows a pop-up query asking the user what to do

  With interactive mode, the system powers off automatically after 60 seconds when hitting the power button. However, you can choose a different behavior from the pop-up query as shown in the figure below.

  Pop-up query for interactive mode



Power Off

The system will power off automatically in 60 seconds.

CHAPTER 8. INPUTTING UNCOMMON CHARACTERS USING THE COMPOSE KEY

The Compose key is a feature that enables you to type special symbols or characters which are missing on your keyboard. In GNOME Desktop, you can define one of the existing keys on your keyboard as the Compose key. You can use the Compose key in combination with other keys, known as Compose key sequences, to enter special characters you type frequently.

8.1. ENABLING THE COMPOSE KEY

You can enable the Compose key either for an individual user or for all users.

8.1.1. Enabling the Compose key for an individual user with the Tweaks application

To enable the Compose key for an individual user by Tweaks application follow these steps.

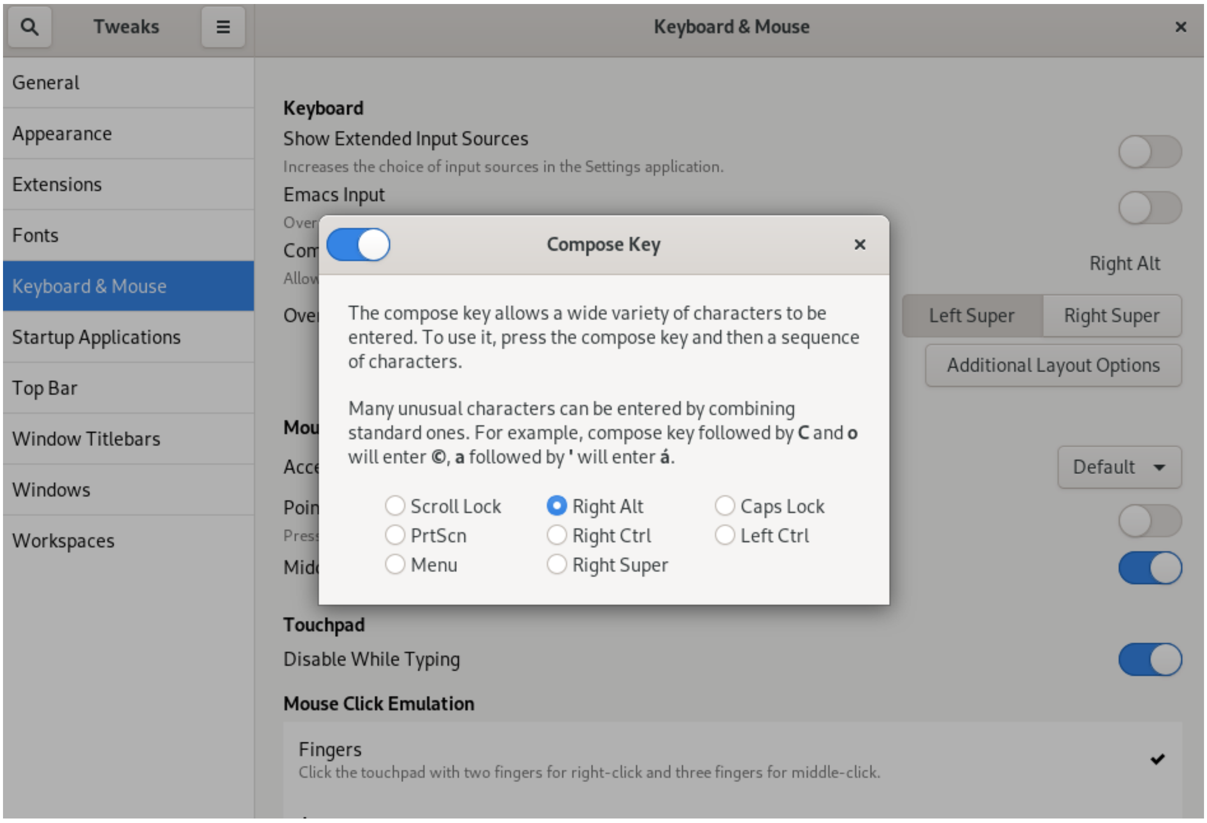
Prerequisites

- The **Tweaks** application is installed on your system.

  ```
  # yum install gnome-tweaks
  ```

Procedure

1. Open the **Tweaks** application.
2. Navigate into **Keyboard & Mouse - Compose Key** and enable it.
3. Choose which key will be used as the Compose key from the listed keys.



Increases the choice of input sources in the Settings application.

The compose key allows a wide variety of characters to be entered. To use it, press the compose key and then a sequence of characters.

Many unusual characters can be entered by combining standard ones. For example, compose key followed by **C** and **o** will enter **©**, **a** followed by **'** will enter **á**.

○ Scroll Lock ● Right Alt ○ Caps Lock
○ PrtScn ○ Right Ctrl ○ Left Ctrl
○ Menu ○ Right Super

Click the touchpad with two fingers for right-click and three fingers for middle-click.

8.1.2. Enabling the Compose key for an individual user using GSettings

To enable the Compose key for an individual user by **gsettings** command follow these steps.

Procedure

- Enable the Compose key and set the compose character to right **alt**.

  ```
  $ gsettings set org.gnome.desktop.input-sources xkb-options "['compose:ralt']"
  ```

  If you want to set a different key than right **alt**, replace *ralt* with the name of the key as specified in the **man xkeyboard-config(7)**.

8.1.3. Enabling the Compose key for all users

To enable the Compose key for all users follow these steps.

Procedure

1. Create a **local** database for machine-wide settings and enter the following:

   ```
    # vim /etc/dconf/db/local.d/00-input-sources
   ```

   ```
   [org/gnome/desktop/input-sources]
   # Set the Right Alt key as the Compose key and enable it
   xkb-options=['compose:ralt']
   ```

   If you want to set a different key than right **alt**, replace *ralt* with the name of the key as specified in the **man xkeyboard-config(7)**.

2. To override the user’s settings and prevent the user from changing it, create a file **/etc/dconf/db/local.d/locks/input-sources** and enter the following:

   ```
   # vim /etc/dconf/db/local.d/locks/input-sources
   ```

   ```
   # Lock the list of enabled XKB options
   /org/gnome/desktop/input-sources/xkb-options
   ```

3. Update the system databases for changes to take effect:

   ```
   # dconf update
   ```

4. Users must log out and back in again before the system-wide settings take effect.

8.2. USING THE COMPOSE KEY TO INPUT CHARACTERS

This procedure shows how to use the Compose key.

Prerequisites

- The Compose key is enabled on your system.

Procedure

1. Press and release the Compose key.

2. Type the key combination to get the specific symbol. For example, type **A E** (in capitals) to get **Æ**, or in lowercase to get **æ**.

8.3. THE COMPOSE KEY SEQUENCES

This section shows some of the Compose key sequences.

Table 8.1. Common sequences

First key	Second key	Third key	Result
o	c		©
d	h		ð
,	a		ą
s	s		ß
<	<		«
?	?		¿
-	-	-	—
^	_	a	ª
=	c		€
1	4		¼

Additional resources

For more sequences refer to the X.Org webpage.

CHAPTER 9. MANAGING STORAGE VOLUMES IN GNOME

This section describes how you can manage storage volumes in GNOME with a virtual file system. GNOME Virtual File System (GVFS) is an extension of the virtual file system interface provided by the libraries the GNOME desktop is built on.

9.1. THE GVFS SYSTEM

The GVFS provides complete virtual file system infrastructure and handles storage in the GNOME desktop. It uses addresses for full identification based on the URI (Uniform Resource Identifier) standard, syntactically similar to URL addresses in web browsers. These addresses in the form of **schema://user@server/path** are the key information determining the kind of service.

The GVFS helps to mount the resources. These mounts are shared between multiple applications. Resources are tracked globally within the running desktop session, which means that even if you quit an application that triggered the mount, it continues to be available for any other application. Multiple applications can access the mount at the same time unless it is limited by a back end. Some protocols by design permit only a single channel.

GVFS mounts removable media in the **/run/media/** directory.

9.2. THE FORMAT OF THE GVFS URI STRING

You must form a URI string to use back end services. This string is a basic identifier used in GVFS, which carries all necessary information needed for unique identification, such as type of service, back end ID, absolute path, or user name if required. You can see this information in the **Files** address bar and GTK+ open or save file dialog.

The following example is a very basic form of the URI string and points to a root directory (/) of the FTP (File Transfer Protocol) server running at *ftp.myserver.net* domain:

Example: URI string pointing to the root FTP directory

```
ftp://ftp.myserver.net/
```

Example: URI string pointing to a text file

```
ssh://joe@ftp.myserver.net/home/joe/todo.txt
```

9.3. MOUNTING A STORAGE VOLUME IN GNOME

In virtual file systems, particular resources are set to be mounted automatically, but the most common way is to trigger mounts manually.

Procedure

1. Open the **Files** application.
2. Press **Ctrl**+**L** to view the location bar.
3. Enter a well-formed URI string.
   Alternatively, **Files** provides the **Connect to server** dialog, which you can find in **Other locations** → **Connect to server**.

4. When asked for login credentials, enter your name and password into the relevant entry boxes.

5. When the mounting process finishes, you can start working with the storage volume.

9.4. UNMOUNTING A STORAGE VOLUME IN GNOME

You can eject or unmount resources using the following procedure.

Procedure

1. Click the **Eject** icon on the chosen mount.

2. Wait until the mount disappears or notification about the safe removal appears.

9.5. OVERVIEW OF FUSE DAEMON IN GVFS

Applications built with the GIO library can access GVFS mounts. In addition, GVFS provides a FUSE daemon which exposes active GVFS mounts. Any application can access active GVFS mounts using the standard POSIX APIs as though mounts were regular file systems.

In certain applications, additional library dependency and new virtual file system (VFS) subsystem specifics might be unsuitable or too complicated. For such reasons and to boost compatibility, GVFS provides a File System in Userspace (FUSE) daemon, which exposes active mounts through its mount for standard Portable Operating System Interface (POSIX) access. This daemon transparently translates incoming requests to imitate a local file system for applications.

IMPORTANT

You might experience difficulties with certain combinations of applications and GVFS back ends.

The FUSE daemon starts automatically with the **gvfs** master daemon and places its mount either in the **/run/user/*UID*/gvfs/** or **~/.gvfs/** files as a fallback. Manual browsing shows individual directories for each GVFS mount. The system passes the transformed path as an argument when you are opening documents from GVFS locations with non-native applications. Note that native GIO applications automatically translate this path back to a native URI.

9.6. GIO TOOLS AND XDG-UTILS IN GNOME

GIO provides several commands that might be useful for scripting or testing. Here is a set of POSIX commands counterparts as follows:

Commands	Description
gio cat	Displays the content of a file.
gio mkdir	Creates a new directory.
gio rename	Renames a file.

gio mount	Provides access to various aspects of the **gio** mounting functionality.
gio set	Sets a file attribute on a file.
gio copy	Makes a copy of a file.
gio list	Lists directory contents.
gio move	Moves a file from one location to another.
gio remove	Removes a file.
gio trash	Sends files or directories to the **Trashcan**. This can be a different folder depending on where the file is located, and not all file systems support this concept. In the common case that the file lives inside a user's home directory, the trash folder is **$XDG_DATA_HOME/Trash**.
gio info	Displays information of the given locations.
gio save	Reads from standard input and saves the data to the given location.
gio tree	Lists the contents of the given locations recursively, in a tree-like format. If no location is given, it defaults to the current directory.

Following additional commands provide more control of GIO specifics:

gio monitor	Monitors files or directories for changes, such as creation, deletion, content and attribute changes, and mount and unmount operations affecting the monitored locations.
gio mime	Lists the registered and recommended applications for the mimetype if no handler is given, else, it is set as the default handler for the mimetype.
gio open	Opens files with the default application that is registered to handle files of this type.

NOTE

For user convenience, **bash** completion is provided as a part of the package.

All these commands are native GIO clients, there is no need for the fallback FUSE daemon to be running. Their purpose is not to be drop-in replacements for POSIX commands, in fact, a very little range of switches is supported. In their basic form, these commands take an URI string as an argument instead of a local path.

This all allows GNOME to be well-supported within **xdg-tools**, a freedesktop.org interoperability project. For example, the **xdg-open** utility calls **gio open** when a running GNOME session is detected, and reads the file type associations from the correct location.

Additional resources

- The **gio(1)** man page.

9.7. EXECUTING THE GIO COMMANDS

The following are a few examples of the GIO commands usage:

- To lists all files in /tmp on a local file system, run:

  ```
  $ gio list file:///tmp
  ```

- To list contents of a text file from a remote machine:

  ```
  $ gio cat ssh://joe@ftp.myserver.net/home/joe/todo.txt
  ```

- To copy the referenced text file to a local /tmp directory, run:

  ```
  $ gio copy ssh://joe@ftp.myserver.net/home/joe/todo.txt /tmp/
  ```

Additional resources

- The **gio** man page.

9.8. OVERVIEW OF GVFS METADATA

The GVFS metadata storage is implemented as a set of key-and-value pairs that bind information to a particular file. Thus, there is a tool for a user or application to save small data designed for runtime information such as icon position, last-played location, position in a document, emblems, notes, and so on.

Whenever you move a file or directory, GVFS moves the metadata accordingly so that metadata stays connected to the respective file. The GVFS stores all metadata privately, so metadata is available only on the machine. However, GVFS tracks mounts and removable media as well.

> **NOTE**
>
> GVFS mounts removable media in the **/run/media/** directory.

To view and manipulate with metadata, you can use:

- the **gio info** command,

- the **gio set** command, or

- any other native GIO way of working with attributes.

Additional resources

- The **gio** man page.

9.9. SETTING CUSTOM GIO METADATA ATTRIBUTE

This procedure describes how to set a custom metadata attribute.

Notice the differences between particular **gio info** calls and data persistence after a move or rename (note the **gio info** command output):

Procedure

1. Create an empty file.

   ```
   $ touch /tmp/myfile
   ```

2. View the metadata of this file.

   ```
   $ gio info -a 'metadata::*' /tmp/myfile
   uri: file:///tmp/myfile
   attributes:
   ```

3. Set a string to this file.

   ```
   $ gio set -t string /tmp/myfile 'metadata::mynote' 'Please remember to delete this file!'
   ```

4. View the metadata.

   ```
   $ gio info -a 'metadata::*' /tmp/myfile
   uri: file:///tmp/myfile
   attributes:
     metadata::mynote: Please remember to delete this file!
   ```

5. Move this file to a new location.

   ```
   $ gio move /tmp/myfile /tmp/newfile
   ```

6. View the metadata.

   ```
   $ gio info -a 'metadata::*' /tmp/newfile
   uri: file:///tmp/newfile
   attributes:
     metadata::mynote: Please remember to delete this file!
   ```

   The metadata persists when you move the file using the GIO API.

Additional resources

- The **gio** man page.

9.10. PASSWORD MANAGEMENT OF GVFS MOUNTS

A typical GVFS mount authenticates on its activation unless the resource allows anonymous authentication or does not require any authentication at all. In a standard GTK+ dialog, you can choose to store or not to store the password.

When you select the persistent storage, the password is stored in the user **keyring**. **GNOME Keyring** is a central place for secrets storage. The password is encrypted and automatically unlocked on desktop session start using the password provided on login. For protecting it by a different password, you can set the password at the first use.

The **Passwords and Keys** application helps to manage the stored password and **GNOME Keyring**. It allows removing individual records or changing passwords.

Additional resources

- For more information on **Passwords and Keys**, see the help manual for **Passwords and Keys** embedded directly in the desktop.

9.11. ACCESSING GVFS MOUNTS THAT REQUIRE AUTHENTICATION

This procedure describes how you can access GVFS mounts using authentication.

Procedure

1. Open **Files**
2. Activate the address bar by pressing **Ctrl**+**L**
3. Enter a well-formed URI string of a service that needs authentication (for example, **sftp://localhost/**).
   The credentials dialog appears asking for a user name, password, and password storage options.
4. Fill in the credentials and confirm.

9.12. GVFS BACK ENDS

Back ends in GVFS provide access to a specific type of resource. The following is a list of available GVFS back ends and their specifications:

NOTE

Some back ends are packaged separately and not installed by default. For installing additional back ends, use the **yum** package manager.

Table 9.1. Available back ends

Back end	Description
afc	Similar to MTP (Media Transfer Protocol), exposes files on your Apple iDevice (connected through USB).

Back end	Description
afp	Apple Filing Protocol (AFP) client to access file services of macOS X and original Mac operation system.
archive	Handles various archiving files (ZIP, TAR) in read-only way.
admin	Provides admin access to the local file system.
burn	A virtual back end that burning applications use as a temporary storage for new CD, DVD, or BD medium contents.
cdda	Exposes Audio CD through separate Waveform Audio File Format (WAV) files.
computer	Virtual back end consolidating active mounts and physical volumes. Acts similarly to a signpost. Previously used by Nautilus for its **Computer** view.
dav, **davs**	WebDAV client, including secure variant. Authentication is possible only during mount. The back end does not support later re-authentication on per-folder basis.
dns-sd	DNS Service Discovery – Avahi client, used during network browsing, forms persistent URIs to discovered services.
ftp	A fully featured File Transfer Protocol (FTP) client. Supports passive transfers by default. Also, handles secure mode over **ftps** (explicit mode) and **ftpis** (implicit mode) schemes.
gphoto2	A Picture Transfer Protocol (PTP) client to access your camera attached by USB or FireWire.
google	Provides access to Google Drive. The Google Drive account needs to be configured over Gnome online accounts.
http	Handles all HTTP requests; useful for easy downloading files from web in client applications.
locatest	Simple testing back end that proxies the **file:/// URI**. The back end supports error injection.

Back end	Description
mtp	Media Transfer Protocol back end for accessing media player and smart phone memory.
network	Allows you to browse Window Network and show shares discovered over Avahi.
recent	A back end used in the file chooser dialog to list recent files used by GNOME applications.
sftp	A fully-featured SSH File Transfer Protocol (SFTP) client.
smb	Access Samba and Windows shares.
trash	A trash back end which allows to restore deleted files.

9.13. TROUBLESHOOTING VOLUME MANAGEMENT IN GNOME

Following are some common errors of volume management in GNOME and ways to resolve them.

9.13.1. Troubleshooting access to GVFS locations from non-GIO clients

If you have problems accessing GVFS locations from your application, it might mean that it is not native GIO client. Native GIO clients are typically all GNOME applications using GNOME libraries (**glib, gio**). The **gvfs-fuse** service is provided as a fallback for non-GIO clients.

Prerequisite

- You have **gvfs-fuse** package installed.

```
$ dnf install gvfs-fuse
```

Procedure

1. Ensure that **gvfs-fuse** is running.

   ```
   $ ps ax | grep gvfsd-fuse
   ```

   Since **gvfs-fuse** runs automatically and it is not recommended to start it by yourself, try logging out and logging in, if **gvfs-fuse** is not running.

2. Find the system user ID (UID) for the **/run/user/*UID*/gvfs/** path by running the **id** command, the **gvfsd-fuse** daemon requires a path it is supposed to expose its services at, or, when the **/run/user/*UID*/gvfs/** path is unavailable, **gvfsd-fuse** uses a **.gvfs** path in your home directory.

   ```
   $ id -u
   ```

3. If **gvfsd-fuse** is still not running, start the **gvfsd-fuse** daemon:

   ```
   $ /usr/libexec/gvfsd-fuse -f /run/user/UID/gvfs
   ```

   Now, the FUSE mount is available, and you can manually browse for the path in your application.

4. Find the GVFS mounts under the /run/user/UID/gvfs/ or .gvfs locations.

9.13.2. Troubleshooting an invisible connected USB disk

Under certain circumstances, when you connect a flash drive, the GNOME Desktop might not display it. If your flash drive is not visible in **Files**, but you can see it in **Disks** application, you can attempt to set the **Show in user interface** flag in **Disks**.

Procedure

1. Open the **Disks** application.
2. Go to the **Additional partition option** actions menu clicking the **cogwheel** icon and click **Edit Mount Options…**
3. Click **Show in user interface** and confirm by clicking **OK**.
4. If the flash drive is still not visible, you can try to physically remove the drive and try connecting it again.

9.13.3. Troubleshooting unknown or unwanted partitions listed in Files

Sometimes, you might see unknown or unwanted partitions when you plug a disk in. For example, when you plug in a flash disk, it is automatically mounted and its volumes are shown in the sidebar. Some devices have a special partition with backups, or help files which you might not want to see each time you plug in the device.

Procedure

1. Open the **Disks** application.
2. Go to the **Additional partition option** actions menu clicking the **cogwheel** icon and click **Edit Mount Options…**
3. Uncheck **Show in user interface**.
4. Confirm by clicking **OK**.

9.13.4. Troubleshooting if a connection to the remote GVFS file system is unavailable

There are number of situations in which the client is unexpectedly and unwillingly disconnected from a virtual file system or a remote disk mount and is not reconnected automatically. You might see the error messages in such situations. Several causes trigger such situations:

- The connection is interrupted. For example, your laptop is disconnected from the Wi-Fi.
- The user is inactive for some time and is disconnected by the server (idle timeout).

- The computer is resumed from sleep mode.

Procedure

1. Unmount file system.
2. Mount it again.
3. If the connection is getting disabled more often, check the settings in the **Network** panel in the GNOME **Settings**.

9.13.5. Troubleshooting a busy disk in GNOME

If you receive a notification about your disk being busy, determine the programs that are accessing the disk. Then, you can end the programs that are running. You can also use the **System Monitor** to kill the programs forcefully.

Prerequisites

- You have **iotop** installed. You can install it by running as a root user:

```
# yum install iotop
```

Procedure

1. Examine the list of open files.
   - Run the **lsof** command to get the list of open files.
   - If **lsof** is not available, run the **ps ax** command.
   - You can use the **System Monitor** application to display the running processes in a GUI.
2. When you have determined the programs, end or kill them as follows:
   - On the command line, execute the **kill** command.
   - In the **System Monitor**, right-click the line with the program process name, and click **End** or **Kill** from the context menu.

Additional resources

- The **kill** man page.

CHAPTER 10. MANAGING BOOKMARKS IN GNOME

In GNOME, you can edit the bookmarks that are displayed in applications and dialogs that manage files.

10.1. BOOKMARKS IN GNOME

Bookmarks integrate into GTK+ and in the GNOME desktop. Every application that presents a standard GTK+ **Open** and **Save** dialog (**GtkFileChooser**) lists bookmarks in the left panel of the dialog. Also, **Files** and its clones present bookmarks in a sidebar.

Besides bookmarks, **GtkFileChooser** lists all other available GVFS volumes and mounts in the sidebar.

While activating a bookmark for the first time, the GVFS subsystem looks for existing mounts and tries to mount the location if the mount does not exist yet. This way, you can authenticate even within the **Open** or **Save** dialog.

Bookmarks are located in the **~/.config/gtk-3.0/bookmarks** file. In the following example, the bookmarked locations are **~/Music**, **~/Pictures**, **~/Videos**, **~/Downloads**, and **~/bin**, so the content of the **~/.config/gtk-3.0/bookmarks** file looks as follows:

```
file:///home/username/Music
file:///home/username/Pictures
file:///home/username/Videos
file:///home/username/Downloads
file:///home/username/bin
```

> NOTE
>
> Replace username with the user name you are logged in.

You can use this file to edit bookmarks based on your requirements.

10.2. ADDING A BOOKMARK IN FILES

You can save a reference to a location by bookmarking it.

Procedure

1. Select the folder or file you want to bookmark.
2. Do one of the following:
   - Press **Ctrl**+**D** or
   - Drag and drop the file or folder to the sidebar.

10.3. BOOKMARKS FOR ALL GNOME USERS

System administrators can set a group of bookmarks for all users at once by allowing access to file shares for the users. **GNOME** stores a list of file-sharing servers in the **~/.config/gtk-3.0/servers** file in the XBEL format. XML Bookmark Exchange Language (XBEL) is an XML standard that allows you share URIs (Uniform Resource Identifiers). It is possible to add the list of file-sharing servers to that file to make file-shares easily accessible to multiple users.

In GNOME, XBEL is used to share desktop bookmarks in applications like **Files**. Here is an example of creating a bookmark titled **GNOME FTP** with the URI **ftp://ftp.gnome.org/** in the **~/.config/gtk-3.0/servers** file.

```
<?xml version="1.0" encoding="UTF-8"?>
<xbel version="1.0"
    xmlns:bookmark="http://www.freedesktop.org/standards/desktop-bookmarks"
    xmlns:mime="http://www.freedesktop.org/standards/shared-mime-info">
  <bookmark href="ftp://ftp.gnome.org/">
    <title>GNOME FTP</title>
  </bookmark>
</xbel>
```

CHAPTER 11. CUSTOMIZING DEFAULT FAVORITE APPLICATIONS

You can customize frequently used applications as your favorite applications. You can see these favorite applications on the GNOME Shell *dash* in the Activities overview. You can use **dconf** to set the favorite applications for an individual user or for all users.

11.1. SETTING DIFFERENT FAVORITE APPLICATIONS FOR INDIVIDUAL USERS

You can set the default favorite applications for individual users. You can add applications into your favorite list easily using any of the methods mentioned below.

- Open the Activities overview and click Activities at the top left of the screen.
- Click the grid button to find the application you want and right-click the application icon and select Add to Favorites.
- Click-and-drag the icon into the dash.

Run the following command to view all the applications that exists in the favorite list:

```
dconf read /org/gnome/shell/favorite-apps
```

NOTE

If you want to lock down the above settings to prevent users from changing them. See Chapter 13, *Locking down selected tasks* for more information.

11.2. SETTING THE SAME FAVORITE APPLICATIONS FOR ALL USERS

You can modify system database files using **dconf** keyfiles to set the same favorites for all users. The following steps edit the **dconf** profile and then create a keyfile to set default favorite applications for all users in the local configuration database.

Procedure

1. Create the key file **/etc/dconf/db/local.d/00-favorite-apps** to provide information for the local database. **/etc/dconf/db/local.d/00-favorite-apps** contents:

```
# Snippet sets gedit, terminal and nautilus as default favorites for all users
[org/gnome/shell]
favorite-apps = ['gedit.desktop', 'gnome-terminal.desktop', 'nautilus.desktop']
```

2. To prevent users from overriding these settings, create the file **/etc/dconf/db/local.d/locks/favorite-apps** with the following content:

```
# Lock default favorite applications
/org/gnome/shell/favorite-apps
```

3. Run the **dconf update** command to incorporate your changes into the system databases.

4. Logout and login again for system-wide changes to take effect.

CHAPTER 12. AUTHENTICATING THE USER IN THE DESKTOP ENVIRONMENT

You can perform the following operations:

- Configure enterprise login options in GNOME,
- Enable smart card authentication, and
- Enable fingerprint authentication.

12.1. USING ENTERPRISE CREDENTIALS TO AUTHENTICATE IN GNOME

You can use your enterprise domain credentials to access your system. This section explains how to log in using enterprise credentials in GNOME, configure enterprise credentials at the GNOME welcome screen, and add an authenticated user with enterprise credentials in GNOME.

12.1.1. Logging in with Enterprise Credentials in GNOME

You can use your domain credentials to login to GNOME if your network has an Active Directory or Identity Management domain available, and you have a domain account.

Prerequisites

- System is configured to use enterprise domain accounts
  For more information, see Joining the RHEL 8 system to the IdM domain using the web console

Procedure

- While logging in, enter the domain user name followed by an @ sign, and then your domain name. For example, if your domain name is **example.com** and the user name is **User**, enter:

  ```
  User@example.com
  ```

  NOTE

  If the machine is already configured for domain accounts, you should see a helpful hint describing the login format.

12.1.2. Configuring enterprise credentials at the GNOME welcome screen

Perform the following steps to configure workstation for enterprise credentials using the welcome screen that belongs to the **GNOME Initial Setup** program.

The initial setup runs only when you create a new user and log into that account for the first time.

Procedure

1. At the login welcome screen, choose **Use Enterprise Login**.

2. Enter your domain name into the **Domain** field.

3. Enter your domain account user name and password.

4. Click **Next**.

5. Depending on the domain configuration, a pop up prompts for the domain administrator's credentials.

12.1.3. Adding an authenticated user with enterprise credentials in GNOME

This procedure helps to create a new user through the **GNOME Settings** application. The user is authenticated using enterprise credentials.

Prerequisites

- Configured enterprise credentials at the GNOME welcome screen. For more information, see Section 12.1.2, "Configuring enterprise credentials at the GNOME welcome screen" .

Procedure

1. Open the **Settings** window clicking icons in the top right corner of the screen.

2. From the list of items, select **Details** > **Users**.

3. Click **Unlock** and enter the administrator's password.

4. Click **Add user...**

5. Click **Enterprise Login**.

6. Fill out the **Domain**, **Username**, and **Password** fields for your enterprise account.

7. Click **Add**.

8. Depending on the domain configuration, a pop up prompts for the domain administrator's credentials.

12.1.4. Troubleshooting enterprise login in GNOME

You can use the realm utility and its various sub-commands to troubleshoot the enterprise login configuration.

Procedure

- To see whether the machine is configured for enterprise logins, run the following command:

  ```
  $ realm list
  ```

NOTE

Network administrators can configure and pre-join workstations to the relevant domains using the kickstart **realm join** command, or running **realm join** in an automated fashion from a script.

Additional resources

- The **realm** man page.

12.2. ENABLING SMART CARD AUTHENTICATION

You can enable workstations to authenticate using smart cards. In order to do so, you must configure GDM to allow prompting for smart cards and configure operating system to log in using a smart card.

You can use two ways to configure the GDM to allow prompting for smart card authentication with GUI or using the command line.

12.2.1. Configuring smart card authentication in GDM using the GUI

You can enable smart card authentication using **dconf** editor GUI. The **dconf** Editor application helps to update the configuration-related values on a dconf database.

Prerequisites

- Install the dconf-editor package:

  ```
  # yum install dconf-editor
  ```

Procedure

1. Open the dconf-Editor application and navigate to **/org/gnome/login-screen**.
2. Turn on the **enable-password-authentication** option.
3. Turn on the **enable-smartcard-authentication** option.

Additional resources

- The **dconf-editor** man page.
- The **dconf** man page.

12.2.2. Configuring smart card authentication in GDM using the command line

You can use the **dconf** command-line utility to enable the GDM login screen to recognize smart card authentication.

Procedure

1. Create a keyfile for the GDM database in **/etc/dconf/db/gdm.d/login-screen**, which contains the following content:

   ```
   [org/gnome/login-screen]
   enable-password-authentication='false'
   enable-smartcard-authentication='true'
   ```

2. Update the system **dconf** databases:

   ```
   # dconf update
   ```

Additional resources

- The **dconf** man page.

12.2.3. Enabling the smart card authentication method in the system

For smart card authentication you can use the **system-config-authentication** tool to configure the system to allow you to use smart cards. Thus, you can avail GDM as a valid authentication method for the graphical environment. The tool is provided by the **authconfig-gtk** package.

Prerequisites

- Install **authconfig-gtk** package
- Configure GDM for smart card authentication

Additional resources

- For details about configuring system to allow smart card authentication and the system-config-authentication tool, see *Configuring smart cards using authselect*

12.3. FINGERPRINT AUTHENTICATION

You can use the **system-config-authentication** tool to enable fingerprint authentication to allow users to login using their enrolled fingerprints. The tool is provided by the **authconfig-gtk** package.

Additional resources

- For more information about fingerprint authentication and the **system-config-authentication** tool, see the *Configuring user authentication using authselect* .

CHAPTER 13. LOCKING DOWN SELECTED TASKS

This section describes how to lock down for users the following tasks:

- Printing
- File saving on disk
- Repartitioning
- User logout and user switching

13.1. LOCKING DOWN PRINTING

You can disable the print dialog from being shown to users. This can be useful if you are giving temporary access to a user or you do not want the user to print to network printers.

IMPORTANT

The feature only works in applications which support it. Not all GNOME and third party applications have this feature enabled. The changes do not have effect on applications which do not support this feature.

To provent applications from printing, lock down the **org.gnome.desktop.lockdown.disable-printing** key:

Procedure

1. Create the user profile in **/etc/dconf/profile/user** unless it already exists:

```
user-db:user
system-db:local
```

2. Create a local database for machine-wide settings in the **etc/dconf/db/local.d/00-lockdown** file:

```
[org/gnome/desktop/lockdown]

# Prevent applications from printing
disable-printing=true
```

3. Override the user’s setting and prevent the user from changing it in the **/etc/dconf/db/local.d/locks/lockdown** file:

```
# List the keys used to configure lockdown
/org/gnome/desktop/lockdown/disable-printing
```

4. Update the system databases:

```
# dconf update
```

Having followed these steps, applications supporting this lockdown key, such as **Evolution**, **Evince**, or **Gedit**, will disable printing.

13.2. LOCKING FILE SAVING ON DISK

You can disable the **Save** and **Save As** dialogs. This can be useful if you are giving temporary access to a user or you do not want the user to save files to the computer.

> **IMPORTANT**
>
> The feature only works in applications which support it. Not all GNOME and third party applications have this feature enabled. The changes will have no effect on applications which do not support this feature.

To prevent applications from file saving, lock down the **org.gnome.desktop.lockdown.disable-save-to-disk** key:

Procedure

1. Create the user profile in **/etc/dconf/profile/user** unless it already exists:

```
user-db:user
system-db:local
```

2. Create a local database for machine-wide settings in the **/etc/dconf/db/local.d/00-lockdown** file:

```
[org/gnome/desktop/lockdown]

# Prevent the user from saving files on disk
disable-save-to-disk=true
```

3. Override the user’s setting and prevent the user from changing it in the **/etc/dconf/db/local.d/locks/lockdown** file:

```
# Lock this key to disable saving files on disk
/org/gnome/desktop/lockdown/disable-save-to-disk
```

4. Update the system databases:

```
# dconf update
```

Having followed these steps, applications supporting this lockdown key, for example **Videos**, **Image Viewer**, **Evolution**, **Document Viewer**, or **GNOME Shell**, will disable their **Save As** dialogs.

13.3. LOCKING REPARTITIONING

polkit enables you to set permissions for individual operations. For **udisks2**, the utility for disk management services, the configuration is located at **/usr/share/polkit-1/actions/org.freedesktop.udisks2.policy**. This file contains a set of actions and default values, which can be overridden by system administrator.

IMPORTANT

polkit configuration stored in **/etc** overrides the configuration shipped by packages in **/usr/share/**.

Procedure

1. Create a file with the same content as in **/usr/share/polkit-1/actions/org.freedesktop.udisks2.policy**:

   ```
   cp /usr/share/polkit-1/actions/org.freedesktop.udisks2.policy /etc/share/polkit-
   1/actions/org.freedesktop.udisks2.policy
   ```

   Do not change the **/usr/share/polkit-1/actions/org.freedesktop.udisks2.policy** file, your changes will be overwritten by the next package update.

2. Delete the action you do not need, and add the following lines to the **/etc/polkit-1/actions/org.freedesktop.udisks2.policy** file:

   ```
   <action id="org.freedesktop.udisks2.modify-device">
     <message>Authentication is required to modify the disks settings</message>
        <defaults>
           <allow_any>no</allow_any>
           <allow_inactive>no</allow_inactive>
           <allow_active>yes</allow_active>
         </defaults>
    </action>
   ```

   Replace **no** by **auth_admin** if you want to ensure only the **root** user is able to perform the action.

3. Save the changes.

When the user tries to change the disks settings, the following message is returned:

```
Authentication is required to modify the disks settings.
```

13.4. LOCKING DOWN USER LOGOUT AND USER SWITCHING

To prevent the user from logging out, use the folowing procedure.

Procedure

1. Create the **/etc/dconf/profile/user** profile, which contains the following lines:

   ```
   user-db:user
   system-db:local
   ```

   where **local** is the name of a dconf database

2. Create the **/etc/dconf/db/local.d/** directory if it does not already exist.

3. Create the **/etc/dconf/db/local.d/00-logout** key file to provide information for the local database:

```
[org/gnome/desktop/lockdown]
# Prevent the user from user switching
disable-log-out=true
```

4. Override the user’s setting, and prevent the user from changing it in the **/etc/dconf/db/local.d/locks/lockdown** file:

```
# Lock this key to disable user logout
/org/gnome/desktop/lockdown/disable-log-out
```

5. Update the system databases:

```
# dconf update
```

6. Users must log out and back in again before the system-wide settings take effect.

IMPORTANT

Users can evade the logout lockdown by switching to a different user. To prevent such scenario, lock down user swithcing as well.

To lock down user switching, use the following procedure:

Procedure

1. Create the **/etc/dconf/profile/user** profile, which contains the following lines:

```
user-db:user
system-db:local
```

where **local** is the name of a dconf database

2. Create the **/etc/dconf/db/local.d/** directory if it does not already exist.

3. Create the **/etc/dconf/db/local.d/00-user-switching** key file to provide information for the local database:

```
[org/gnome/desktop/lockdown]
# Prevent the user from user switching
disable-user-switching=true
```

4. Override the user’s setting, and prevent the user from changing it in the **/etc/dconf/db/local.d/locks/lockdown** file:

```
# Lock this key to disable user switching
/org/gnome/desktop/lockdown/disable-user-switching
```

5. Update the system databases:

```
# dconf update
```

6. Users must log out and back in again before the system-wide settings take effect.

CHAPTER 14. MANAGING USER SESSIONS

14.1. WHAT GDM IS

The GNOME Display Manager (GDM) is a graphical login program running in the background that runs and manages the **X.Org** display servers for both local and remote logins.

GDM is a replacement for XDM, the X Display Manager. However, GDM is not derived from XDM and does not contain any original XDM code. In addition, there is no support for a graphical configuration tool in GDM, so editing the **/etc/gdm/custom.conf** configuration file is necessary to change the GDM settings.

14.2. RESTARTING GDM

When you make changes to the system configuration such as setting up the login screen banner message, login screen logo, or login screen background, restart GDM for your changes to take effect.

> **WARNING**
>
> Restarting the service forcibly interrupts any currently running GNOME session of any desktop user who is logged in. This can result in users losing unsaved data.

Procedure

- To restart the GDM service, run the following command:

```
# systemctl restart gdm.service
```

Procedure

- To display results of the GDM configuration, run the following command:

```
$ DCONF_PROFILE=gdm gsettings list-recursively org.gnome.login-screen
```

14.3. ADDING AN AUTOSTART APPLICATION FOR ALL USERS

To start an application automatically when any user logs in, create a **.desktop** file for that application in the **/etc/xdg/autostart/** directory.

Procedure

1. Create a **.desktop** file in the **/etc/xdg/autostart/** directory:

```
[Desktop Entry]
Type=Application
Name=Files
```

```
Exec=nautilus -n
OnlyShowIn=GNOME;
AutostartCondition=GSettings org.gnome.desktop.background show-desktop-icons
```

Replace **Files** with the name of the application.

Replace **nautilus -n** with the command you want to use to run the application.

2. Use the **AutostartCondition** key to check for a value of a GSettings key.
   The session manager runs the application automatically if the key's value is true. If the key's value changes in the running session, the session manager starts or stops the application, depending on what the previous value for the key was.

Additional resources

- You can also configure autostart applications for an individual user through a graphical interface. Use the **Tweaks** application, which is available from the **gnome-tweaks** package.

14.4. CONFIGURING AUTOMATIC LOGIN

As an administrator, you can enable automatic login from the **Users panel** in **GNOME Settings**, or you can set up automatic login manually in the GDM custom configuration file, as follows.

Run the follwoing procedure to set up automatic login for a user john.

Procedure

- Edit the **/etc/gdm/custom.conf** file, and make sure that the **[daemon]** section in the file specifies the following:

```
[daemon]
AutomaticLoginEnable=True
AutomaticLogin=john
```

Replace **john** with the user that you want to be automatically logged in.

14.5. CONFIGURING AUTOMATIC LOGOUT

User sessions that have been idle for a specific period of time can be ended automatically. You can set different behavior based on whether the machine is running from a battery or from mains power by setting the corresponding GSettings key, then locking it.

WARNING

Users can potentially lose unsaved data if an idle session is automatically ended.

To set automatic logout for a mains powered machine:

Procedure

1. Create a local database for machine-wide settings in the **/etc/dconf/db/local.d/00-autologout** file:

   ```
   [org/gnome/settings-daemon/plugins/power]
   # Set the timeout to 900 seconds when on mains power
   sleep-inactive-ac-timeout=900
   # Set action after timeout to be logout when on mains power
   sleep-inactive-ac-type='logout'
   ```

2. Override the user’s setting, and prevent the user from changing it in the **/etc/dconf/db/local.d/locks/autologout** file:

   ```
   # Lock automatic logout settings
   /org/gnome/settings-daemon/plugins/power/sleep-inactive-ac-timeout
   /org/gnome/settings-daemon/plugins/power/sleep-inactive-ac-type
   ```

3. Update the system databases:

   ```
   # dconf update
   ```

4. Users must log out and back in again before the system-wide settings take effect.

The following GSettings keys are of interest:

- org.gnome.settings-daemon.plugins.power.sleep-inactive-ac-timeout
  The number of seconds that the computer needs to be inactive before it goes to sleep if it is running from AC power.

- org.gnome.settings-daemon.plugins.power.sleep-inactive-ac-type
  What should happen when the timeout has passed if the computer is running from AC power.

- org.gnome.settings-daemon.plugins.power.sleep-inactive-battery-timeout
  The number of seconds that the computer needs to be inactive before it goes to sleep if it is running from power.

- org.gnome.settings-daemon.plugins.power.sleep-inactive-battery-type
  What should happen when the timeout has passed if the computer is running from battery power.

If you want to list available values for a key, use the following procedure:

Procedure

- Run the **gsettings range** command on the required key. For example:

```
$ gsettings range org.gnome.settings-daemon.plugins.power sleep-inactive-ac-type
enum
'blank'
'suspend'
'shutdown'
'hibernate'
'interactive'
'nothing'
'logout'
```

14.6. SETTING SCREEN BRIGHTNESS AND IDLE TIME

This section describes how to:

- Configure the drop in the brightness leve
- Set brightness level
- Set idle time

Configuring the drop in the brightness level

To set the drop in the brightness level when the device has been idle for some time:

Procedure

1. Create a local database for machine-wide settings in the **/etc/dconf/db/local.d/00-power** file including these lines:

   ```
   [org/gnome/settings-daemon/plugins/power]
   idle-dim=true
   ```

2. Update the system databases:

   ```
   # dconf update
   ```

3. Users must log out and back in again before the system-wide settings take effect.

Setting brightness level

To set brightness level:

Procedure

1. Create a local database for machine-wide settings in the **/etc/dconf/db/local.d/00-power** file, as in the following example:

   ```
   [org/gnome/settings-daemon/plugins/power]
   idle-brightness=30
   ```

   Replace **30** with the integer value you want to use.

2. Update the system databases:

   ```
   # dconf update
   ```

3. Users must log out and back in again before the system-wide settings take effect.

Setting idle time

To set idle time after which the screen is blanked and the default screensaver is displayed:

Procedure

1. Create a local database for machine-wide settings in **/etc/dconf/db/local.d/00-session**, as in the following example:

```
[org/gnome/desktop/session]
idle-delay=uint32 900
```

Replace **900** with the integer value you want to use.

You must include the **uint32** along with the integer value as shown.

2. Update the system databases:

```
# dconf update
```

3. Users must log out and back in again before the system-wide settings take effect.

14.7. LOCKING THE SCREEN WHEN THE USER IS IDLE

To enable the screensaver and make the screen lock automatically when the user is idle, follow this procedure:

Procedure

1. Create a local database for system-wide settings in the **etc/dconf/db/local.d/00-screensaver** file:

```
[org/gnome/desktop/session]
# Set the lock time out to 180 seconds before the session is considered idle
idle-delay=uint32 180
[org/gnome/desktop/screensaver]
# Set this to true to lock the screen when the screensaver activates
lock-enabled=true
# Set the lock timeout to 180 seconds after the screensaver has been activated
lock-delay=uint32 180
```

You must include the **uint32** along with the integer key values as shown.

2. Override the user’s setting, and prevent the user from changing it in the **/etc/dconf/db/local.d/locks/screensaver** file:

```
# Lock desktop screensaver settings
/org/gnome/desktop/session/idle-delay
/org/gnome/desktop/screensaver/lock-enabled
/org/gnome/desktop/screensaver/lock-delay
```

3. Update the system databases:

```
# dconf update
```

4. Users must log out and back in again before the system-wide settings take effect.

14.8. SCREENCAST RECORDING

GNOME Shell features a built-in screencast recorder. The recorder allows users to record desktop or application activity during their session and distribute the recordings as high-resolution video files in the **webm** format.

To make a screencast:

Procedure

1. To start the recording, press **Ctrl**+**Alt**+**Shift**+**R** shortcut.
   When the recorder is capturing the screen activity, it displays a red circle in the bottom-right corner of the screen.

2. To stop the recording, press **Ctrl**+**Alt**+**Shift**+**R** shortcup.
   The red circle in the bottom-right corner of the screen disappears.

3. Navigate to the ~/**Videos** directory where you can find the recorded video with a file name that starts with Screencast and includes the date and time of the recording.

NOTE

The built-in recorder always captures the entire screen, including all monitors in multi-monitor setups.

CHAPTER 15. CONFIGURING THE DESKTOP ENVIRONMENT FOR ACCESSIBILITY

This section explains how a system administrator can configure a system with the desktop environment to support users with a visual impairment.

Accessibility in Red Hat Enterprise Linux 8 desktop for the blind users is ensured by the **Orca** screen reader, which is included in the default installation of the operating system.

Orca reads information from the screen and communicates it to the user using:

- Speech synthesizer - provides a speech output
- Braille display - provides a tactile output

For more information on Orca settings, see Orca's help page .

For Orca's communication outputs to function properly, the system administrator must:

- Configure the **brltty** service
- Switch on the **Always Show Universal Access Menu**
- Enable the Festival speech synthesizer

15.1. CONFIGURING THE BRLTTY SERVICE

The Braille display is a device that uses the **brltty** service to provide tactile output for visually impaired users.

In order that a Braille display works correctly, system administrators must:

- Enable the brltty service
- Authorize users of a Braille display device
- Set the driver for a Braille display device
- Configure a Braille display device

15.1.1. Enabling the brltty service

The Braille display cannot work unless the **brltty** service is running. By default, **brltty** is disabled.

To enable **brltty** to be started on boot, use the following procedure.

Procedure

- To enable the **brltty** service on boot, run:

```
# systemctl enable brltty
```

Verification steps

1. Reboot the system.

2. Make sure that the **brltty** service is running:

```
# systemctl status brltty
● brltty.service - Braille display driver for Linux/Unix
   Loaded: loaded (/usr/lib/systemd/system/brltty.service; enabled; vendor pres>
   Active: active (running) since Tue 2019-09-10 14:13:02 CEST; 39s ago
  Process: 905 ExecStart=/usr/bin/brltty (code=exited, status=0/SUCCESS)
 Main PID: 914 (brltty)
    Tasks: 3 (limit: 11360)
   Memory: 4.6M
   CGroup: /system.slice/brltty.service
           └─914 /usr/bin/brltty
```

15.1.2. Authorizing users of a Braille display device

To set the users who are authorized to use a Braille display device, you can choose one of the following methods, which have an equal effect:

- Authorizing users of a Braille display device with brltty.conf

- Authorizing users of a Braille display device with brlapi.key

Authorization using the **/etc/brlapi.key** file is suitable only for the file systems where users or groups can be assigned to a file.

Authorization using the **/etc/brltty.conf** file is suitable even for the file systems where users or groups cannot be assigned to a file.

15.1.2.1. Authorizing users of a Braille display device with brltty.conf

Procedure

1. Open the **/etc/brltty.conf** file, and find the section called **Application Programming Interface Parameters**.

2. Specify the users.

   - To specify one or more individual users, list the users on the following line:

     ```
     api-parameters Auth=user:user_1, user_2, …  # Allow some local user
     ```

   - To specify a user group, enter its name on the following line:

     ```
     api-parameters Auth=group:group  # Allow some local group
     ```

15.1.2.2. Authorizing users of a Braille display device with brlapi.key

Authorization using the **/etc/brlapi.key** file is suitable only for the file systems where users or groups can be assigned to a file.

Prerequisites

- Your system must use a file system where users or groups can be assigned to a file.

Procedure

1. Create the **/etc/brlapi.key** file.

   ```
   # mcookie > /etc/brlapi.key
   ```

2. Change ownership of the **/etc/brlapi.key** to particular user or group.

   - To specify an individual user:

     ```
     # chown user_1 /etc/brlapi.key
     ```

   - To specify a group:

     ```
     # chown group_1 /etc/brlapi.key
     ```

3. Adjust the content of **/etc/brltty.conf** by including the following line:

   ```
   api-parameters Auth=keyfile:/etc/brlapi.key
   ```

15.1.3. Setting the driver for a Braille display device

The **braille-driver** directive in **/etc/brltty.conf** file specifies a two-letter driver identification code of the driver for the Braille display device.

Procedure

- Decide whether you want to use the autodetection for finding the appropriate driver for your Braille display device.

  - To use autodetection, use the default option as follows:

    ```
    braille-driver auto  # autodetect
    ```

    > **WARNING**
    >
    > Autodetection tries all drivers. Therefore, it might take a long time or even fail. For this reason, setting up a particular driver is recommended.

  - If you do not want to use the autodetection, specify the identification code of the required driver in the **braille-driver** directive.
    Choose the identification code of required driver from the list provided in **/etc/brltty.conf**, for example:

    ```
    braille-driver xw  # XWindow
    ```

You can also set multiple drivers, separated by commas, and autodetection is then performed among them.

15.1.4. Configuring a Braille display device

The **braille-device** directive in the **/etc/brltty.conf** file specifies the device to which the Braille display device is connected.

15.1.4.1. Supported types of Braille display device

This section describes which types of Braille display devices are supported.

Table 15.1. Braille display device types and the corresponding syntax

Braille device type	Syntax of the type
Serial device	serial:path [a]
USB device	[serial-number] [b]
Bluetooth device	bluetooth:address

[a] Relative paths are at **/dev**.

[b] The brackets ([]) here indicate optionality.

Example settings for particular Braille display devices:

```
braille-device serial:ttyS0                # First serial device
braille-device usb:                        # First USB device matching braille driver
braille-device usb:nnnnn                   # Specific USB device by serial number
braille-device bluetooth:xx:xx:xx:xx:xx:xx # Specific Bluetooth device by address
```

You can also set multiple devices, separated by commas, and each of them will be probed in turn.

IMPORTANT

If the device is connected by a serial-to-USB adapter, setting **braille-device** to **usb:** does not work. In this case, identify the virtual serial device that the kernel has created for the adapter. The virtual serial device can look like this:

```
serial:ttyUSB0
```

You can find the actual device name in the kernel messages on the device plug with the following command:

```
# dmesg | fgrep ttyUSB0
```

15.1.4.2. Setting specific parameters for Braille display devices

To set specific parameters for particular Braille display devices, use the **braille-parameters** directive in **/etc/brltty.conf** file. The **braille-parameters** directive passes non-generic parameters through to the braille driver. Choose the required parameters from the list in **/etc/brltty.conf**.

15.1.4.2.1. Setting the text table

The **text-table** directive in **/etc/brltty.conf** specifies which text table is used to encode the symbols. Relative paths to text tables are stored within the **/etc/brltty/Text/** directory.

Procedure

1. Decide whether you want to use the autoselection for finding the appropriate text table.
2. If you want to use the autoselection, leave **text-table** specified to auto, which is the default option.

   ```
   text-table auto  # locale-based autoselection
   ```

   This ensures that local-based autoselection with fallback to **en-nabcc** is performed.

   For example, to use the **text table** for American English:

   ```
   text-table en_US  # English (United States)
   ```

15.1.4.2.2. Setting the contraction table

The **contraction-table** directive in the **/etc/brltty.conf** file specifies which table is used to encode the abbreviations. Relative paths to particular contraction tables are stored within the **/etc/brltty/Contraction/** directory.

Procedure

- Choose the required contraction-table from the list in **/etc/brltty.conf**.
  For example, to use the contraction table for American English, grade 2:

  ```
  contraction-table en-us-g2  # English (US, grade 2)
  ```

> **WARNING**
>
> If not specified, no contraction table is used.

15.2. SWITCHING ON THE ALWAYS SHOW UNIVERSAL ACCESS MENU

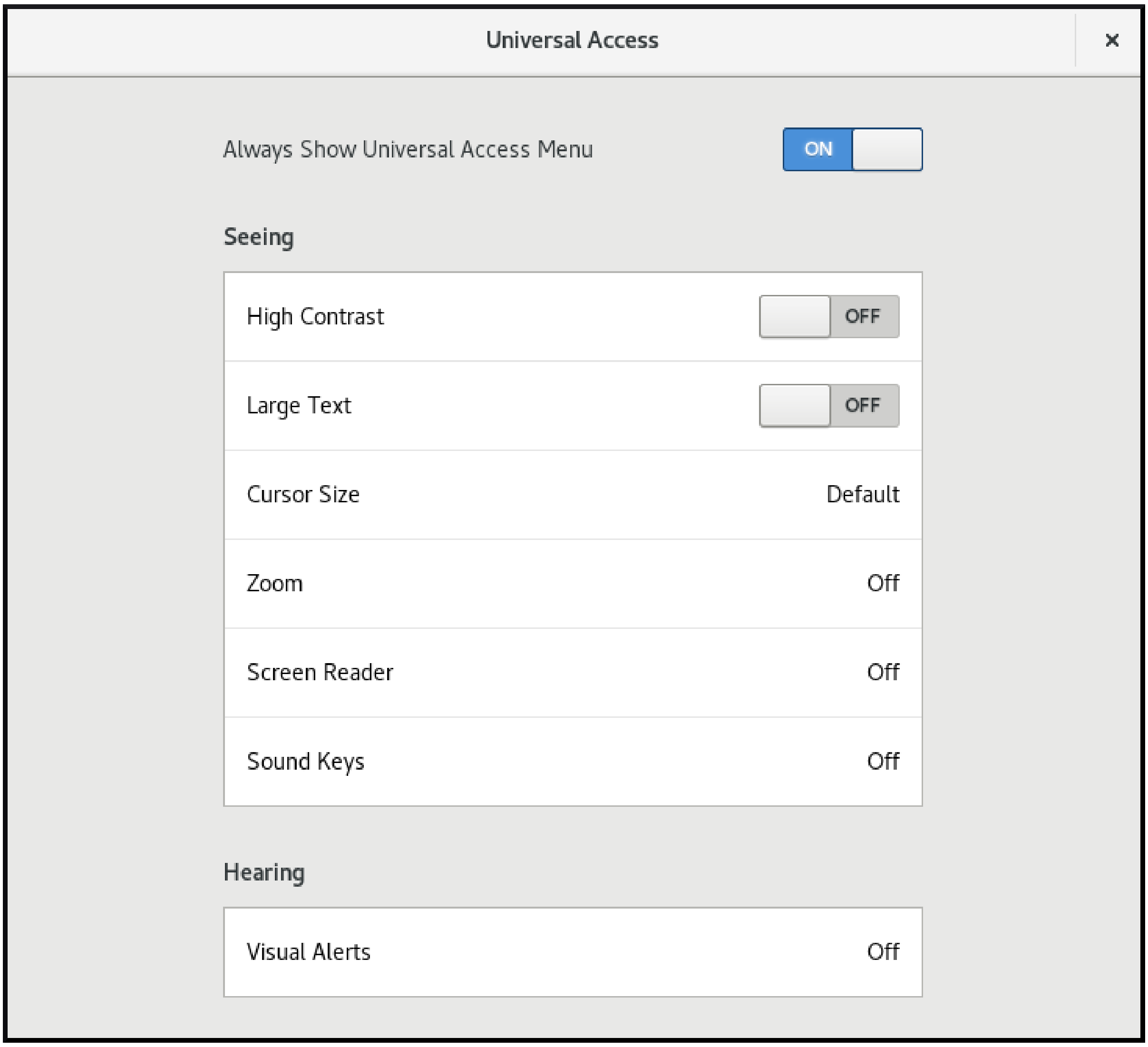
To activate the **Orca** screen reader, switch on **Always Show Universal Access Menu** as described in the following procedure.

Procedure

1. Open the **Gnome Settings** menu, and click **Universal Access**.

2. Switch on **Always Show Universal Access Menu**.

Switching on the Always Show Universal Access Menu in GNOME Settings



Universal Access

Always Show Universal Access Menu: ON

Seeing

High Contrast	OFF
Large Text	OFF
Cursor Size	Default
Zoom	Off
Screen Reader	Off
Sound Keys	Off

Hearing

Visual Alerts	Off

Verification steps

- Optionally, verify that the **Universal Access Menu** icon is displayed on the top bar even if all options from this menu are switched off.

Alternatively, you can switch the **Orca** screen reader on by pressing the **Super+Alt+S** key combination. As a result, the **Universal Access Menu** icon is displayed on the top bar.

> **WARNING**
>
> If you activate **Orca** by pressing **Super+Alt+S**, the icon disappears in case that the user switches off all of the provided options from the **Universal Access Menu**. Missing icon can cause difficulties to users with a visual impairment. System administrators can prevent the inaccessibility of the icon by switching on the **Always Show Universal Access Menu** as described in the above procedure. When the **Always Show Universal Access Menu** is switched on, the icon is displayed on the top bar even in the situation when all options from this menu are switched off.

15.3. ENABLING THE FESTIVAL SPEECH SYNTHESIS SYSTEM

By default, **Orca** uses the **eSpeak** speech synthesizer, but it also supports the **Festival Speech Synthesis System (Festival)**. Both **eSpeak** and **Festival** synthesize voice differently. Some users might prefer **Festival** to the default **eSpeak** synthesizer.

15.3.1. Enabling Festival

To enable **Festival** to be automatically started on boot, follow this procedure.

Prerequisites

- All packages thet are necessary for the **Festival** stack are installed on the system:

  ```
  # yum install festival festival-freebsoft-utils
  ```

Procedure

1. Create a new systemd unit file in the **/etc/systemd/system/** directory, and make the file executable:

   ```
   # touch /etc/systemd/system/festival.service
   # chmod 664 /etc/systemd/system/festival.service
   ```

2. Ensure that the script in the **/usr/bin/festival_server** file is used to run **Festival** by adding the following content to the **/etc/systemd/system/festival.service** file:

   ```
   [Unit]
   Description=Festival speech synthesis server
   [Service]
   ExecStart=/usr/bin/festival_server
   Type=simple
   ```

3. Notify systemd that a new **festival.service** file exists:

   ```
   # systemctl daemon-reload
   # systemctl start festival.service
   ```

4. Enable the **festival** service:

```
# systemctl enable festival
```

15.3.2. Enabling the required voice

Festival offers multiples voices provided in these packages:

- **festvox-awb-arctic-hts**
- **festvox-bdl-arctic-hts**
- **festvox-clb-arctic-hts**
- **festvox-kal-diphone**
- **festvox-rms-arctic-hts**
- **festvox-slt-arctic-hts**
- **hispavoces-pal-diphone**
- **hispavoces-sfl-diphone**

To make a particular voice or voices that users require available, follow this procedure.

Prerequisites

- You know which voices are available and which voices the users of the system prefer. For detailed information about a particular voice, run:

```
# yum info package_name
```

Procedure

1. To make the required voice available, install the package with this voice:

```
# yum install package_name
```

2. Reboot the system to apply changes:

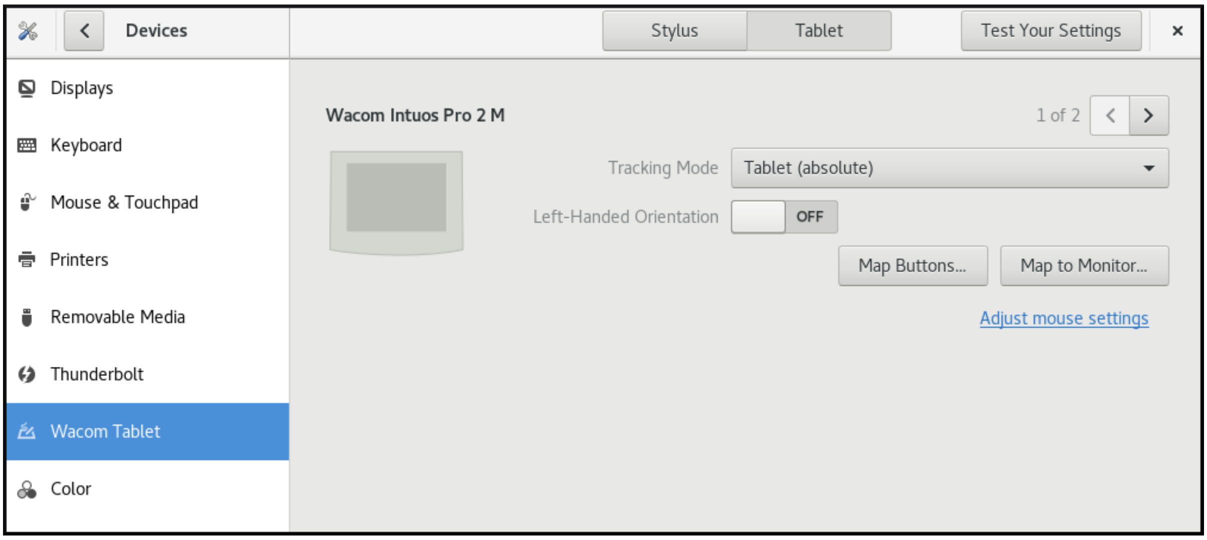
```
# reboot
```

CHAPTER 16. TABLETS

To manage Wacom tablets connected to your system, use the following tools:

- The **gnome-settings-daemon** service
- The **Wacom Tablet** settings panel in the GNOME environment

The Wacom Tablet settings panel for a tablet

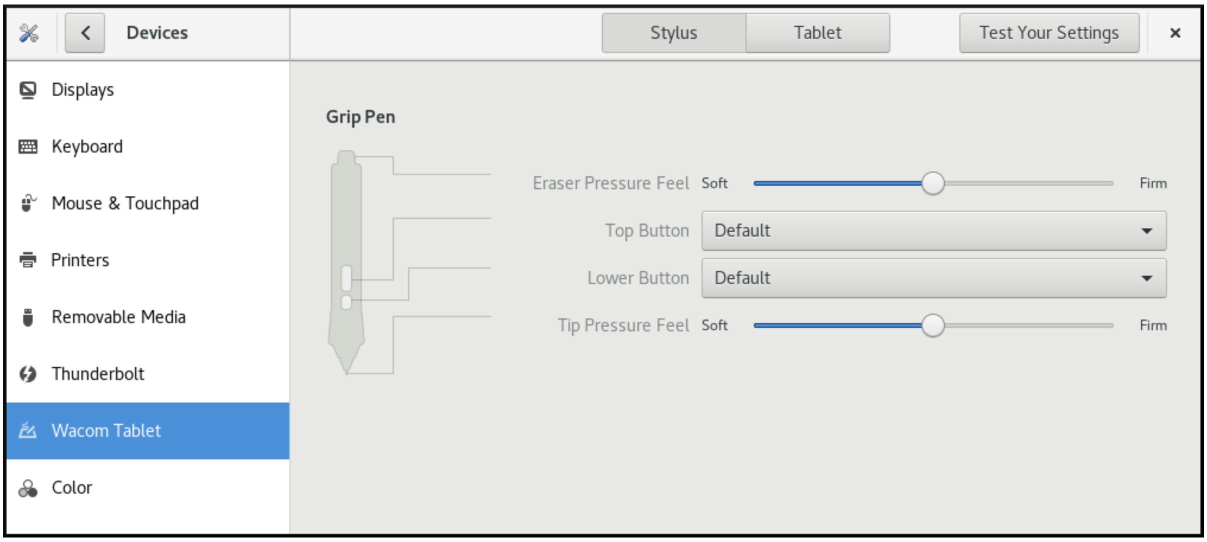


Wacom Intuos Pro 2 M

Tracking Mode: Tablet (absolute)

Left-Handed Orientation: OFF

The Wacom Tablet settings panel for a grip pen



Grip Pen

Eraser Pressure Feel

Top Button: Default

Lower Button: Default

Tip Pressure Feel

Both these tools, as well as the **libinput** stack, use the **libwacom** tablet client library, which stores the data about Wacom tablets.

If you want to add support for a new tablet into the **libwacom** library, you must ensure that a definition file for this new tablet exists.

16.1. PREPARING A TABLET DEFINITION FILE

The **libwacom** tablet client library needs a definiton file for the tablet that you want to add.

To ensure that the tablet definition file exists, follow this procedure.

Prerequisites

Prerequisites

- Make sure that your device is recognized by **libwacom**:

  ```
  libwacom-list-local-devices
  ```

  The **libwacom-list-local-devices** tool lists all local devices recognized by **libwacom**.

  If your device is not listed, the device is missing from libwacom's database. However, the device might still be visible as an event device in the kernel under **/proc/bus/input/devices**, and if you use the **X.Org** display server, in the **X session** on the **xinput** list.

Procedure

1. Make sure that the **libwacom-data** package is installed.
   Most tablet definition files are included in this package. If the package is installed, the tablet definition files are locally available in the **/usr/share/libwacom/** directory.

2. Check whether the definition file is available in the **/usr/share/libwacom/** directory.
   To use the screen mapping correctly, support for your tablet must be included in the **libwacom** database and in the udev rules file.

   IMPORTANT

   A common indicator that a device is not supported by **libwacom** is that it works normally in a GNOME session, but the device is not correctly mapped to the screen.

3. If the definition file for your device is not available in **/usr/share/libwacom/**, you have these options:

   - The required definition file may already be available in the linuxwacom/libwacom upstream repository. So you can try to find the definition file there. If you find your tablet model in the list, it is sufficient to copy the file to the local machine.

   - You can create a new tablet definition file. Use the **data/wacom.example** file below, and edit particular lines based on the characteristics of your device.

     ```
     # Example model file description for a tablet
     [Device]

     # The product is the product name announced by the kernel
     Product=Intuos 4 WL 6x9

     # Vendor name of this tablet
     Vendor=Wacom

     # DeviceMatch includes the bus (usb, serial), the vendor ID and the actual
     # product ID
     DeviceMatch=usb:056a:00bc

     # Class of the tablet. Valid classes include Intuos3, Intuos4, Graphire, Bamboo, Cintiq
     Class=Intuos4

     # Exact model of the tablet, not including the size.
     Model=Intuos 4 Wireless
     ```

```
# Width in inches, as advertised by the manufacturer
Width=9

# Height in inches, as advertised by the manufacturer
Height=6

# Optional features that this tablet supports
# Some features are dependent on the actual tool used, e.g. not all styli
# have an eraser and some styli have additional custom axes (e.g. the
# airbrush pen). These features describe those available on the tablet.
#
# Features not set in a file default to false/0

[Features]
# This tablet supports styli (and erasers, if present on the actual stylus)
Stylus=true

# This tablet supports touch.
Touch=false

# This tablet has a touch ring (Intuos4 and Cintiq 24HD)
Ring=true
# This tablet has a second touch ring (Cintiq 24HD)
Ring2=false

# This tablet has a vertical/horizontal scroll strip
VStrip=false
HStrip=false

# Number of buttons on the tablet
Buttons=9

# This tablet is built-in (most serial tablets, Cintiqs)
BuiltIn=false
```

16.2. ADDING SUPPORT FOR A NEW TABLET

To add support for a new tablet into the **libwacom** tablet information client library, follow this procedure.

Prerequisites

- The definition file for the tablet that you want to add exists.
  For more information on ensuring that the definition file exists, see Section 16.1, “Preparing a tablet definition file”.

Procedure

1. Add and install the definition file with the **.tablet** suffix:

   ```
   cp the-new-file.tablet /usr/share/libwacom/
   ```

Once installed, the tablet is part of libwacom's database. The tablet is then available through **libwacom-list-local-devices**.

2. Create a new **/etc/udev/rules/99-libwacom-override.rules** file with the following content so that your settings are not overwritten:

```
ACTION!="add|change", GOTO="libwacom_end"
KERNEL!="event[0-9]*", GOTO="libwacom_end"

[new tablet match entries go here]

LABEL="libwacom_end"
```

3. Reboot your system.

16.3. WHERE IS THE WACOM TABLET CONFIGURATION STORED

Configuration for your Wacom tablet is stored in GSettings in the **/org/gnome/settings-daemon/peripherals/wacom/machine-id-device-id** key, where **machine-id** is a D-Bus machine ID, and **device-id** is a tablet device ID.

The configuration schema for the tablet is **org.gnome.settings-daemon.peripherals.wacom**.

Stylus configuration is stored in the **/org/gnome/settings-daemon/peripherals/wacom/device-id/tool-id** key, where **tool-id** is the identifier for the stylus used for professional ranges. For the consumer ranges with no support for **tool-id**, a generic identifier is used instead.

The configuration schema for the stylus is **org.gnome.settings-daemon.peripherals.wacom.stylus**. The configuration schema for the eraser is **org.gnome.settings-daemon.peripherals.wacom.eraser**.

16.4. LISTING AVAILABLE WACOM TABLET CONFIGURATION PATHS

To get the full list of tablet configuration paths used on a particular machine, use the **gsd-list-wacom** tool, which is provided by the **gnome-settings-daemon** package.

Prerequisites

- Make sure that the **gnome-settings-daemon** package is installed on your system.

```
# yum install gnome-settings-daemon
```

Procedure

- To get the full list of tablet configuration paths used on your machine, run the following command:

```
$ /usr/libexec/gsd-list-wacom
```

IMPORTANT

Using **machine-id**, **device-id**, and **tool-id** in configuration paths allows for shared home directories with independent tablet configuration per machine. However, when sharing home directories between Machines, the Wacom settings apply only to one machine. This is because the **machine-id** for your Wacom tablet is included in the configuration path of the /**org**/**gnome**/**settings-daemon**/**peripherals**/**wacom**/**machine-id-device-id** **GSettings** key, which stores your tablet settings.

CHAPTER 17. INSTALLING APPLICATIONS USING FLATPAK

17.1. THE FLATPAK TECHNOLOGY

Flatpak provides sandbox environment for application building, deployment, distribution, and installation. Applications you run using Flatpak have minimum access to the host system, which protects the system installation against third-party applications. Flatpak provides application stability regardless of your Linux kernel architecture, name, version, or release. Flatpak allows you to install and run multiple versions of the same application simultaneously.

The details of the application packaged with Flatpak are stored in the flatpakref file that uses the **.flatpakref** extension. Each flatpakref file contains information enabling it to add the remote and install the application. You can access flatpakref files remotely in a remote repository, or you can download and manage them locally on your computer.

Flatpak can be used in combination with third party centralized repositories for applications packaged with Flatpak. Note that Red Hat supports Flatpak as a method of installing applications. Applications from third-party repositories are not supported by Red Hat.

17.2. SETTING UP FLATPAK

Procedure:

- To install Flatpak, use:

  ```
  $ sudo yum install flatpak
  ```

17.3. MANAGING APPLICATIONS PACKAGED WITH FLATPAK IN THE GRAPHICAL INTERFACE

The following section describes how to search for, install, launch, and update Flatpak applications in the graphical interface.

Prerequisites

- Installed Flatpak.

17.3.1. Installing Flatpak applications in the graphical interface

The following section describes hoe to search for applications packaged with Flatpak.

Procedure

1. Go to the remote repository that hosts applications packaged with Flatpak.
2. Download the flatpakref file for the application.
3. Open the flatpakref file with the **Software Installer**.
4. Click the **Install** button and wait for the installation process to be complete.
5. Click the **Launch** button to launch the application.

17.3.2. Updating Flatpak applications in the graphical interface

The following section describes how to make all applications update automatically.

Procedure

1. Open the **Software** application.
2. Click the icon in the top left corner.
   The pop-up menu appears.
3. Click on **Update Preferences**.
   The pop-up menu appears.
4. Enable **Automatic Updates** and **Automatic Update Notifications**.

17.4. MANAGING APPLICATIONS USING FLATPAK ON THE COMMAND-LINE

The following section describes how to search for, install, launch, and update Flatpak applications from the command-line.

Prerequisites

- Installed Flatpak.

17.4.1. Adding a remote repository

If the flatpakref file is not stored locally on your computer, it is necessary to enable the remote repository.

Procedure

- To enable the remote repository, use:

  ```
  $ flatpak remote-add --if-not-exists remote-repository path-to-the-remote-repository
  ```

  Replace *remote-repository* with the name of the remote repository that hosts applications packaged with Flatpak, and *path-to-the-remote-repository* with the path to the remote repository.

17.4.2. Searching for Flatpak applications

Prerequisites

- Enabled remote repository.

Procedure

- To search for an applications, use:

  ```
  $ flatpak search application-name
  ```

The search returns the ID of the application and the remote repository that hosts the application.

17.4.3. Installing Flatpak applications

Prerequisites

- Enabled remote repository.

Procedure

- To install an application, use:

  ```
  $ flatpak install remote-repository application-id
  ```

  Replace *remote-repository* with the name of the remote that hosts the application, and replace *application-id* with the ID of the application.

17.4.4. Launching Flatpak applications

Procedure

- To launch the application, use:

  ```
  $ flatpak run application-id
  ```

  Replace *application-id* with the ID of the application.

17.4.5. Updating Flatpak applications

Procedure

- To update all applications installed with Flatpak, use:

  ```
  $ flatpak update
  ```