Red Hat Enterprise Linux 9

Getting started with the GNOME desktop environment

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Legal Notice

Abstract

This document describes how to use GNOME, which is the only desktop environment available in RHEL 9. It explains the basics of using GNOME Shell and certain GNOME applications.

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MAKING OPEN SOURCE MORE INCLUSIVE

Red Hat is committed to replacing problematic language in our code, documentation, and web properties. We are beginning with these four terms: master, slave, blacklist, and whitelist. Because of the enormity of this endeavor, these changes will be implemented gradually over several upcoming releases. For more details, see our CTO Chris Wright's message.

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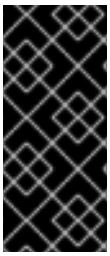
4. Enter your suggestion for improvement in the **Description** field. Include links to the relevant parts of the documentation.
5. Click **Create** at the bottom of the dialogue.

CHAPTER 1. OVERVIEW OF GNOME ENVIRONMENTS

You can switch between several user interfaces and graphics back ends in GNOME.



IMPORTANT

To function properly, GNOME requires your system to support **3D acceleration**. This includes bare metal systems, as well as hypervisor solutions such as **VMWare**.

If GNOME does not start or performs poorly on your VMWare virtual machine (VM), see the following solution: Why does the GUI fail to start on my VMware virtual machine?

1.1. GNOME ENVIRONMENTS, BACK ENDS, AND DISPLAY PROTOCOLS

In RHEL 9, there are two available GNOME environments:

- GNOME Standard
- GNOME Classic

Both environments can use two different protocols as their graphical back ends:

- 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**
- The **X11** protocol, which uses **X.Org** as the display server.

The default combination in RHEL 9 is the GNOME Standard environment using **GNOME Shell on Wayland** as the display server. However, due to certain **Wayland** limitations, you might want to switch the graphics protocol stack to **X11**. You can also switch from GNOME Standard to GNOME Classic.

Thus, you can select from the following combinations of back ends and environments when logging in:

- **GNOME Shell** on **Wayland** (the default combination in RHEL 9)
- **GNOME Shell** on **X11**
- **GNOME Classic** on **Wayland**
- **GNOME Classic** on **X11**

Additional resources

- For information about how to switch the environments, see Selecting GNOME environment and display protocol.

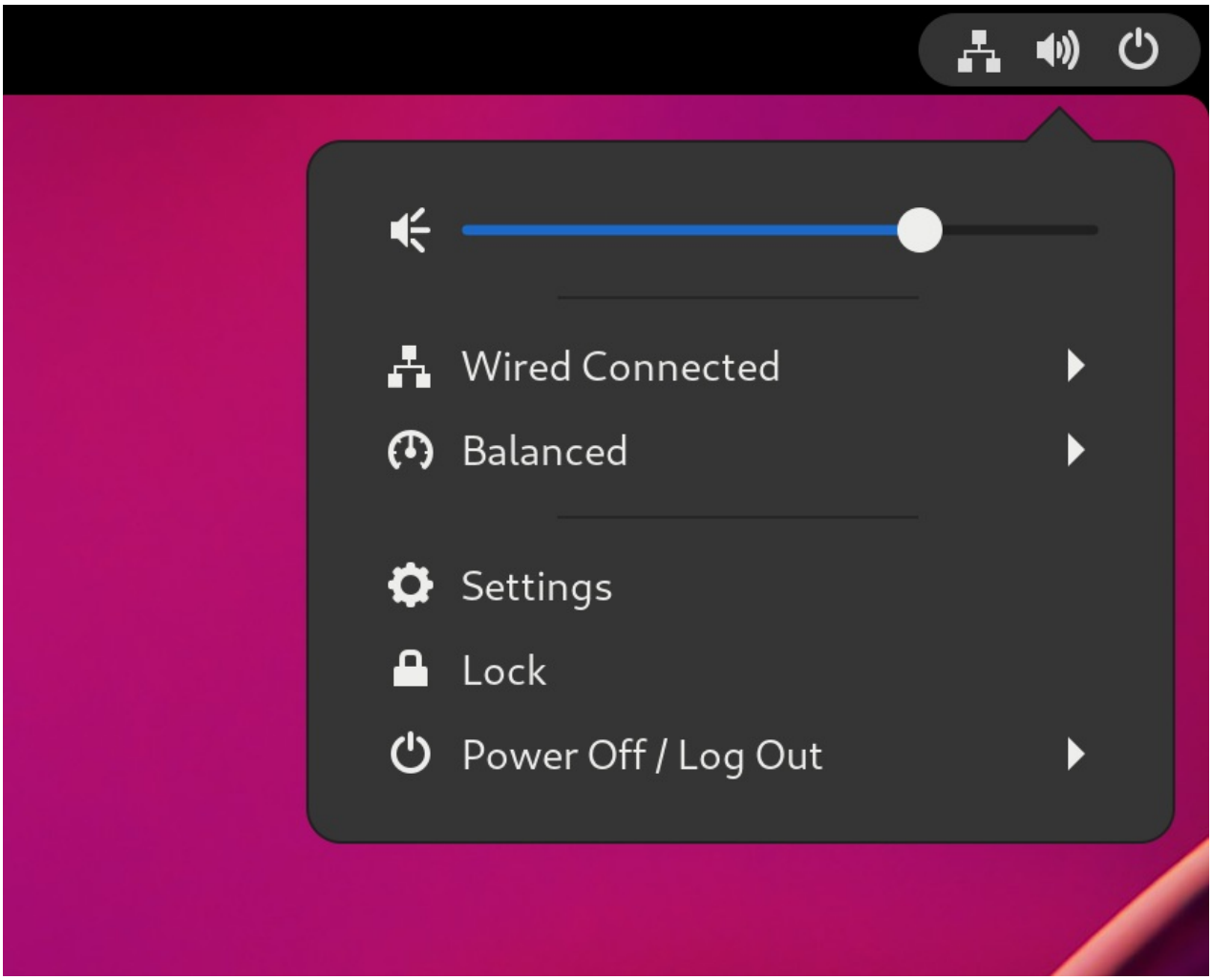
1.2. GNOME STANDARD

The 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 upper-right corner, and provides the following functionality:

- Updating settings
- Controlling the sound volume
- Accessing your Wi-Fi connection
- Switching the user
- Logging out
- Turning off the computer

Activities Overview

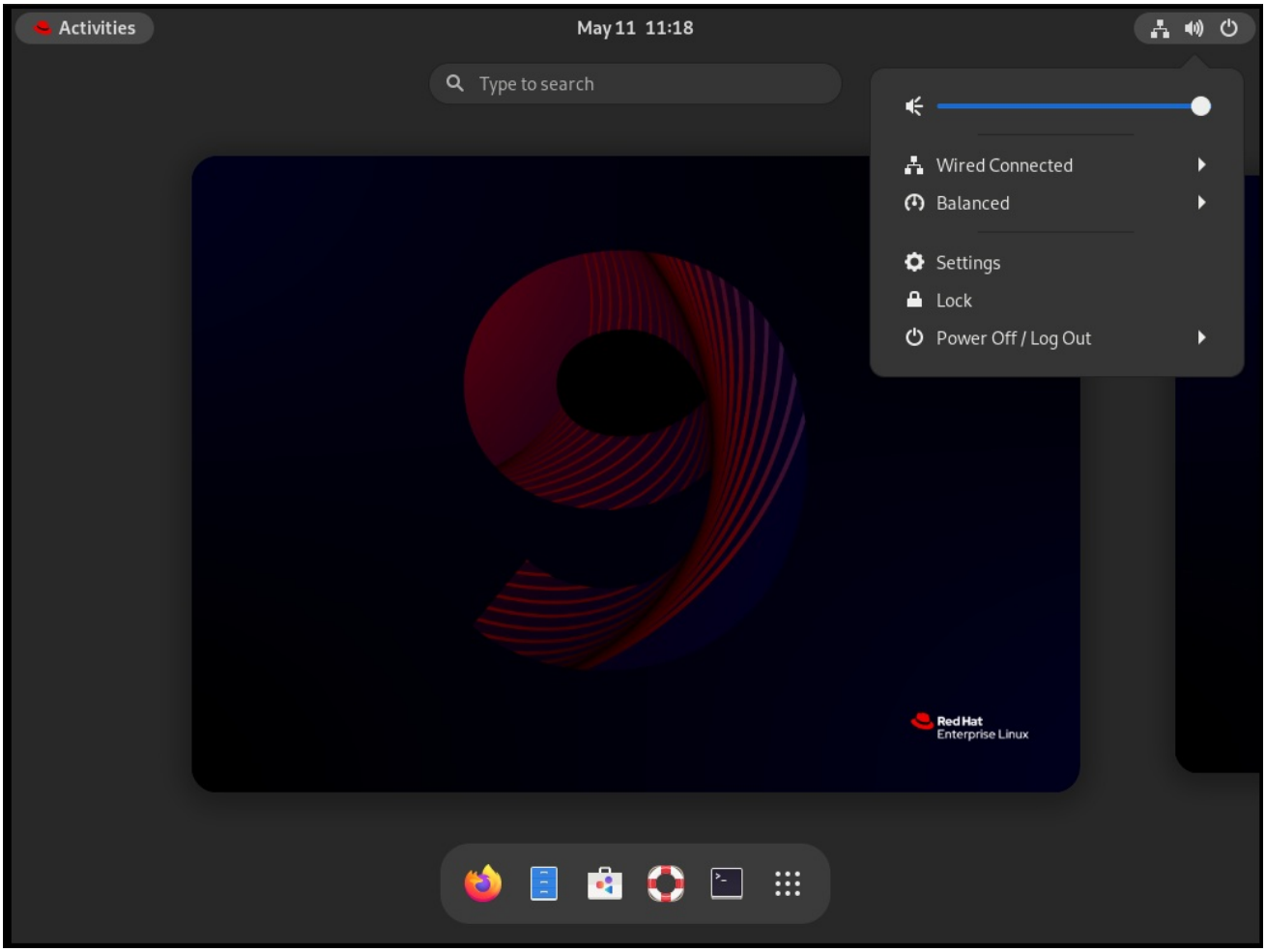
The **Activities Overview** features windows and applications views that let you run applications and windows and switch between them.
The **search entry** at the top allows for searching various items available on the desktop, including applications, documents, files, and configuration tools.

The horizontal bar on the bottom contains a list of favorite and running applications. You can add or remove applications from the default list of favorites.

Message tray

The **message tray** provides access to pending notifications. The **message tray** shows when you press **Super**+**M**.

The GNOME Standard desktop



1.3. GNOME CLASSIC

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

The GNOME Classic user interface consists of these major components:

Applications and Places

The **Applications** menu is displayed at the upper-left corner of the screen. It gives you 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 you 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 available workspaces is set to 4 by default.

Minimize and maximize buttons

Window title bars in GNOME Classic feature the minimize and maximize buttons that let you 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

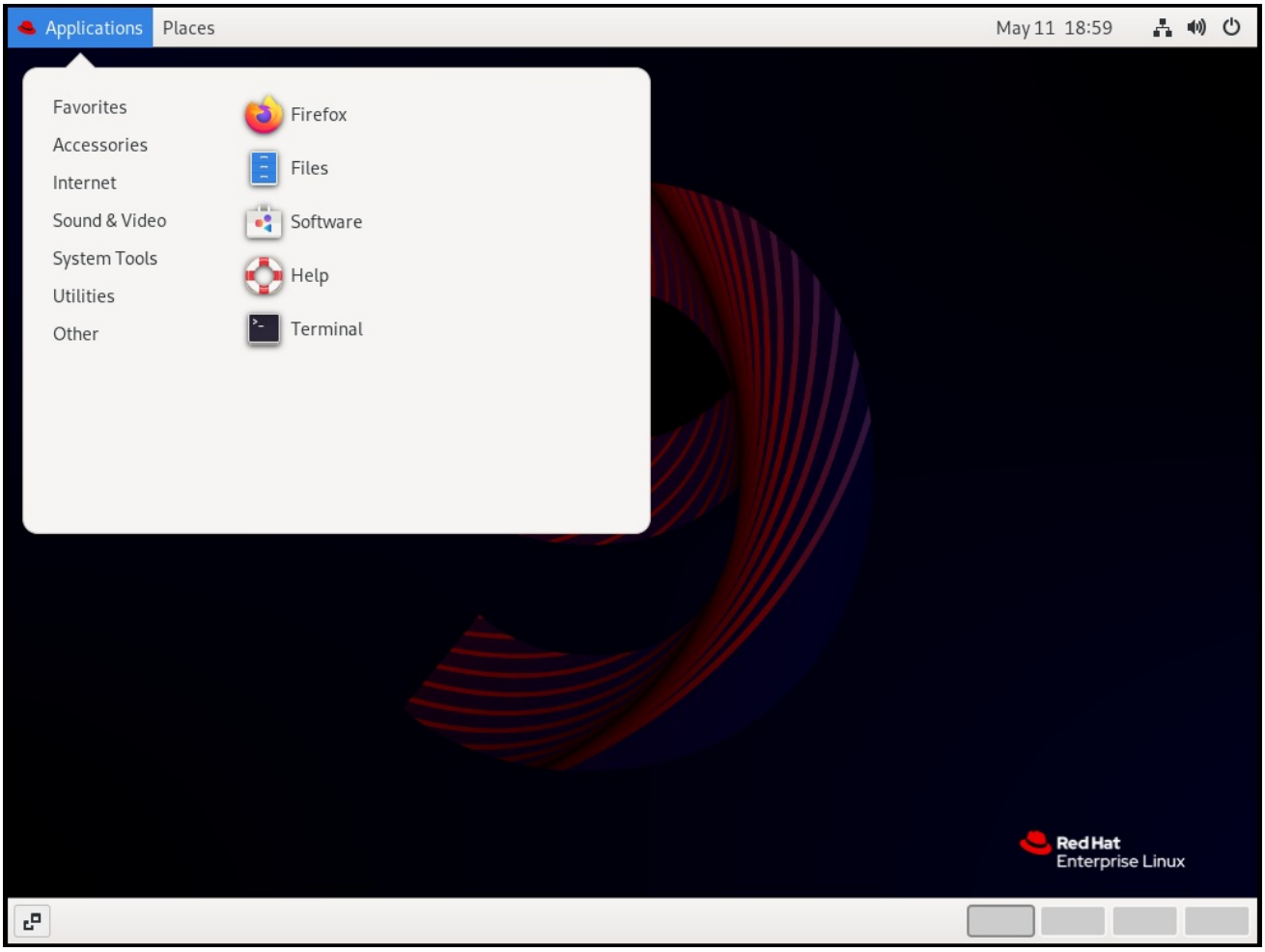
In GNOME Classic, windows in the **Super**+**Tab** window switcher are not grouped by application.

System menu

The **system menu** is located in the upper-right corner, and enables the following actions:

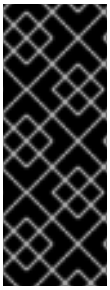
- Updating settings
- Controlling the sound volume
- Accessing your Wi-Fi connection
- Switching the user
- Logging out
- Turning off the computer

The GNOME Classic desktop with the Favorites submenu of the Applications menu



1.4. 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:

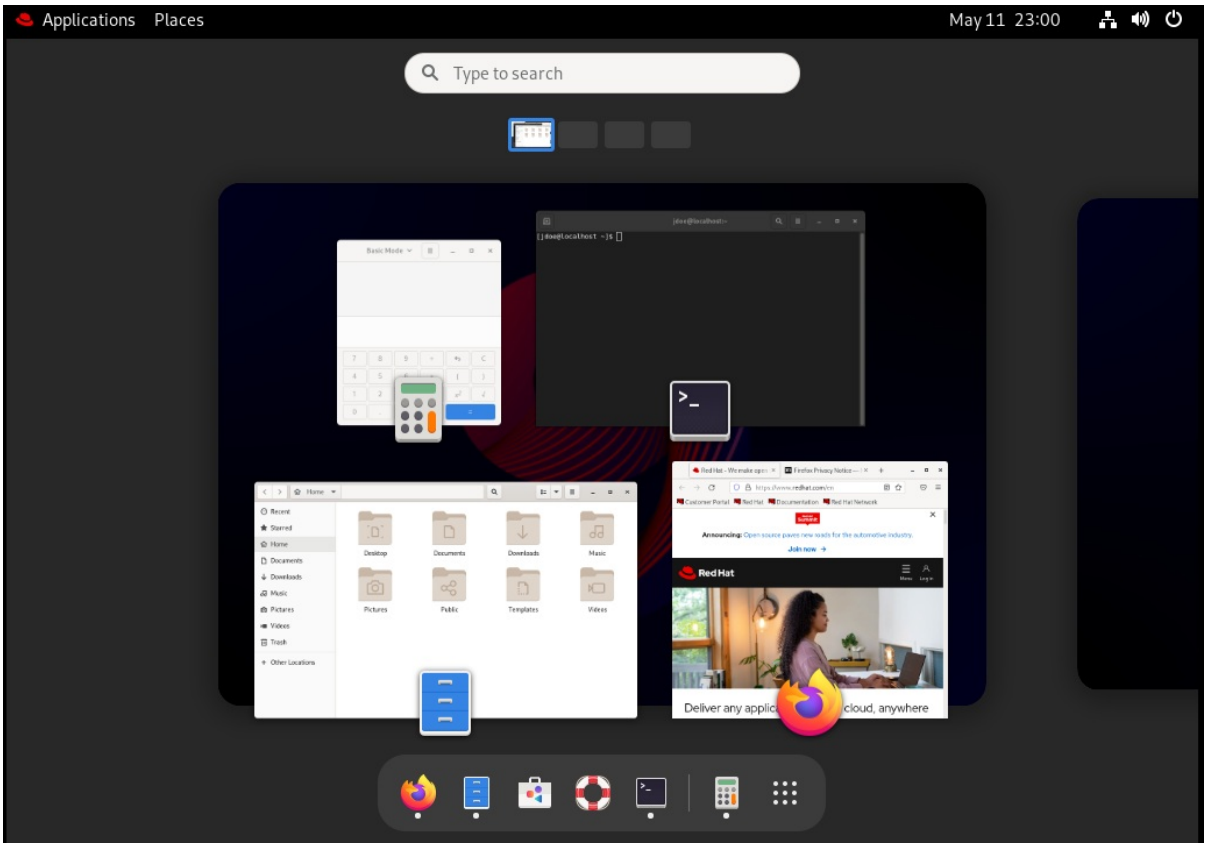
```
"hasOverview": true
```

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 horizontal panel on the bottom of the screen) is displayed.
   - The bottom panel is not displayed.

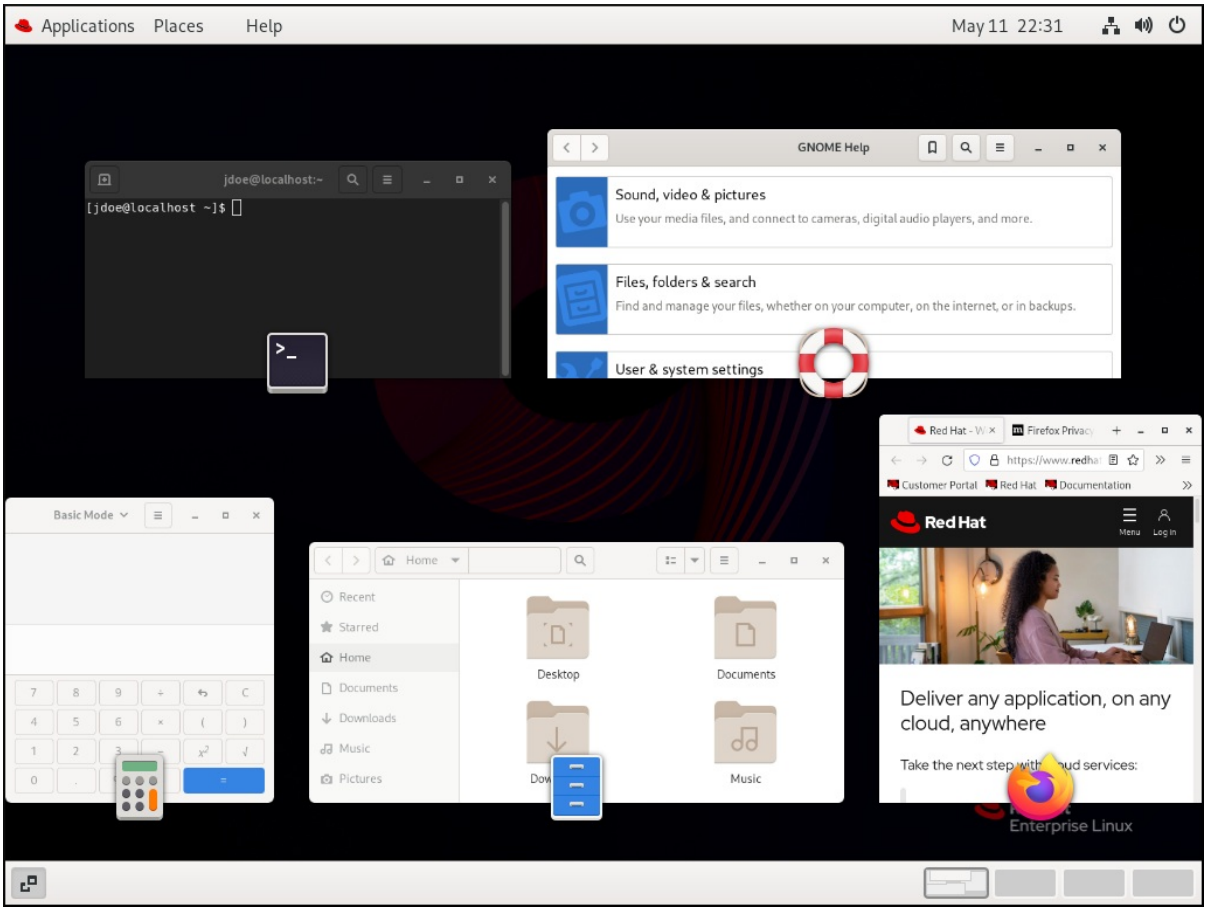
Window overview with "hasOverview": true



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



1.5. GRAPHICS BACK ENDS IN RHEL 9

In RHEL 9, you can choose between two protocols to build a graphical user interface:

Wayland

The **Wayland** protocol uses **GNOME Shell** as its compositor and display server, which is further referred to as **GNOME Shell on Wayland**.

X11

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

New installations of RHEL 9 automatically select **GNOME Shell on Wayland**. However, you can switch to **X.Org**, or select the required combination of GNOME environment and display server.

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** starts automatically at login, 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 certain clients that rely on features specific to **X11** might behave differently under **Xwayland**. For such specific clients, you can switch to the **X.Org** display server.

Input devices

RHEL 9 uses a 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 you can optionally enable the legacy **X.Org evdev** driver if **libinput** does not support your input device.

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 about the **Wayland** project, see Wayland documentation.

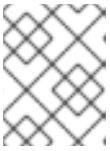
1.6. SELECTING GNOME ENVIRONMENT AND DISPLAY PROTOCOL

The default desktop environment for RHEL 9 is GNOME Standard with **GNOME Shell on Wayland** as the display server. However, due to certain limitations of **Wayland**, you might want to switch the graphics protocol stack. You might also want to switch from GNOME Standard to GNOME Classic.

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

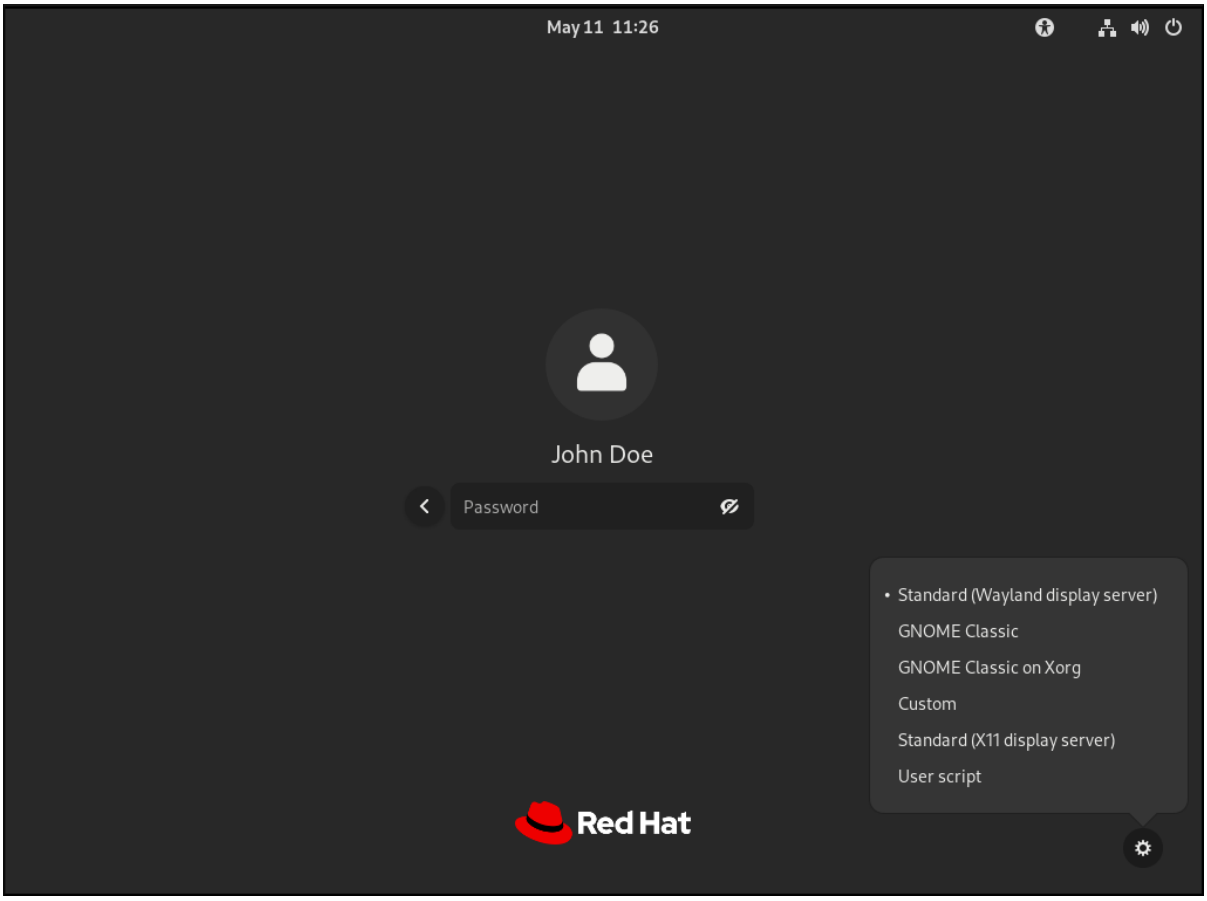
Procedure

1. From the login screen (GDM), click the gear button in the right bottom corner of the screen.



NOTE

You cannot access this option from the lock screen. The login screen appears when you first start RHEL or when you log out of your current session.



2. From the drop-down menu that appears, select the option that you prefer.
In the menu, the **X.Org** display server is also marked as **X11**.

1.7. DISABLING WAYLAND FOR ALL USERS

You can disable the Wayland session for all users on the system, so that they always log in with the X11 session.

Procedure

1. Open the **/etc/gdm/custom.conf** file as the **root** user.
2. Locate the following line in the **[daemon]** section of the file:

```
#WaylandEnable=false
```

3. Uncomment the line by remove the **#** character. As a result, the line says:

```
WaylandEnable=false
```

4. Reboot the system.

CHAPTER 2. LAUNCHING APPLICATIONS IN GNOME

You can launch installed applications using several different methods in the GNOME desktop environment.

2.1. LAUNCHING AN APPLICATION IN THE STANDARD GNOME SESSION

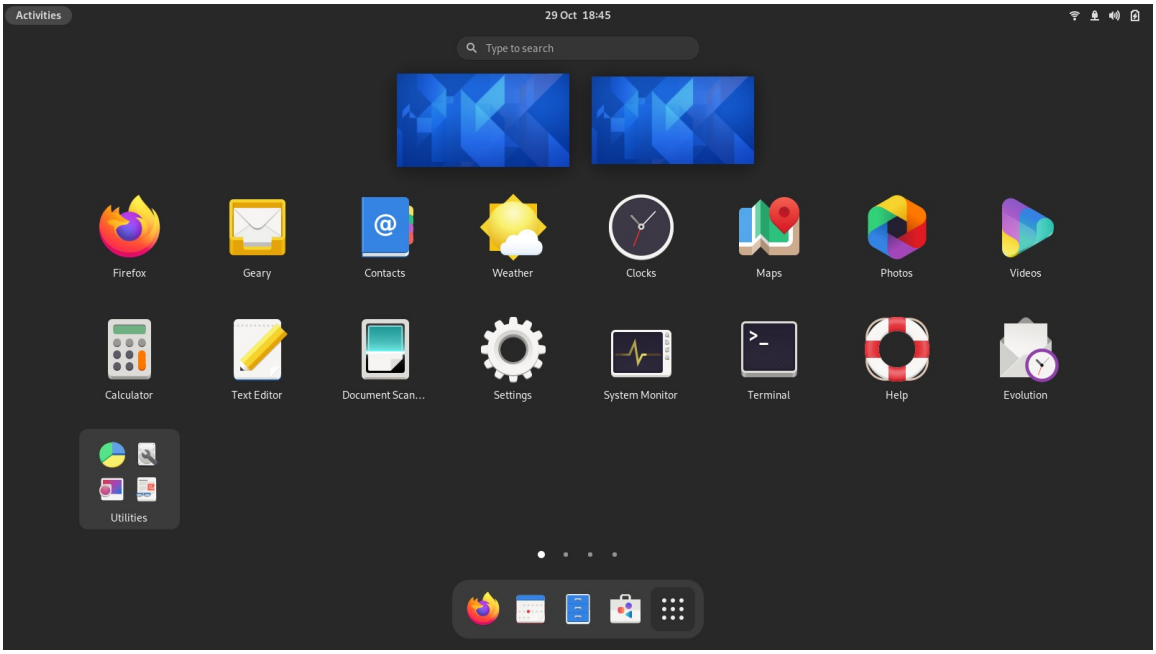
This procedure launches a graphical application in the GNOME desktop environment.

Prerequisites

- You are using the standard GNOME session.

Procedure

1. Open the **Activities Overview** screen using either of the following ways:
   - Click **Activities** in the top panel.
   - Press the **Super** key, which is usually labeled with the Windows logo, ⌘, or .
2. Find the application using either of the following ways:
   - Click the **Show Applications** icon in the bottom horizontal bar.



   - Type the name of the required application in the search entry.
3. Click the application in the displayed list.

2.2. LAUNCHING AN APPLICATION IN GNOME CLASSIC

This procedure launches a graphical application in the GNOME Classic desktop environment.

Prerequisites

- You are using the GNOME Classic session.

Procedure

1. Open the **Applications** menu in the top panel.
2. Choose the required application from the available categories, which can include:
   - Favorites
   - Accessories
   - Graphics
   - Internet
   - Office
   - Sound & Video
   - System Tools
   - Utilities

2.3. LAUNCHING AN APPLICATION IN GNOME USING A COMMAND

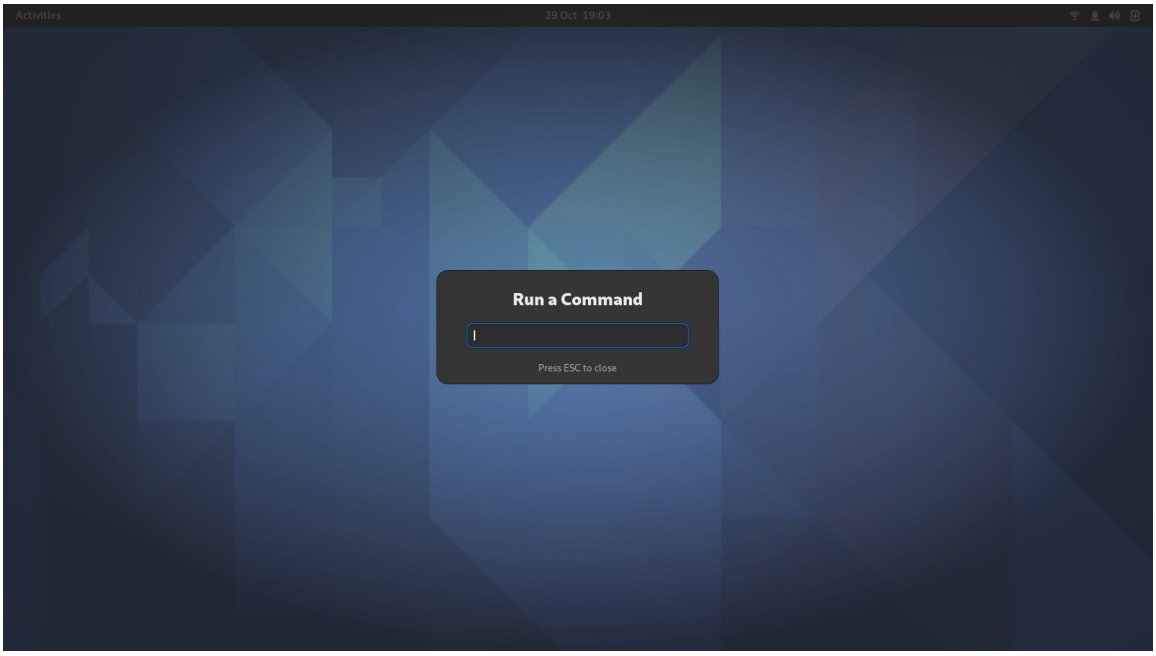
This procedure launches a graphical application in GNOME by entering a command.

Prerequisites

- You know the command that starts the application.

Procedure

1. Open a command prompt using either of the following ways:
   - Open a terminal.
   - Press the **Alt**+**F2** shortcut to open the **Enter a Command** screen.



2. Type the application command in the command prompt.
3. Confirm the command by pressing **Enter**.

2.4. LAUNCHING AN APPLICATION AUTOMATICALLY ON LOGIN

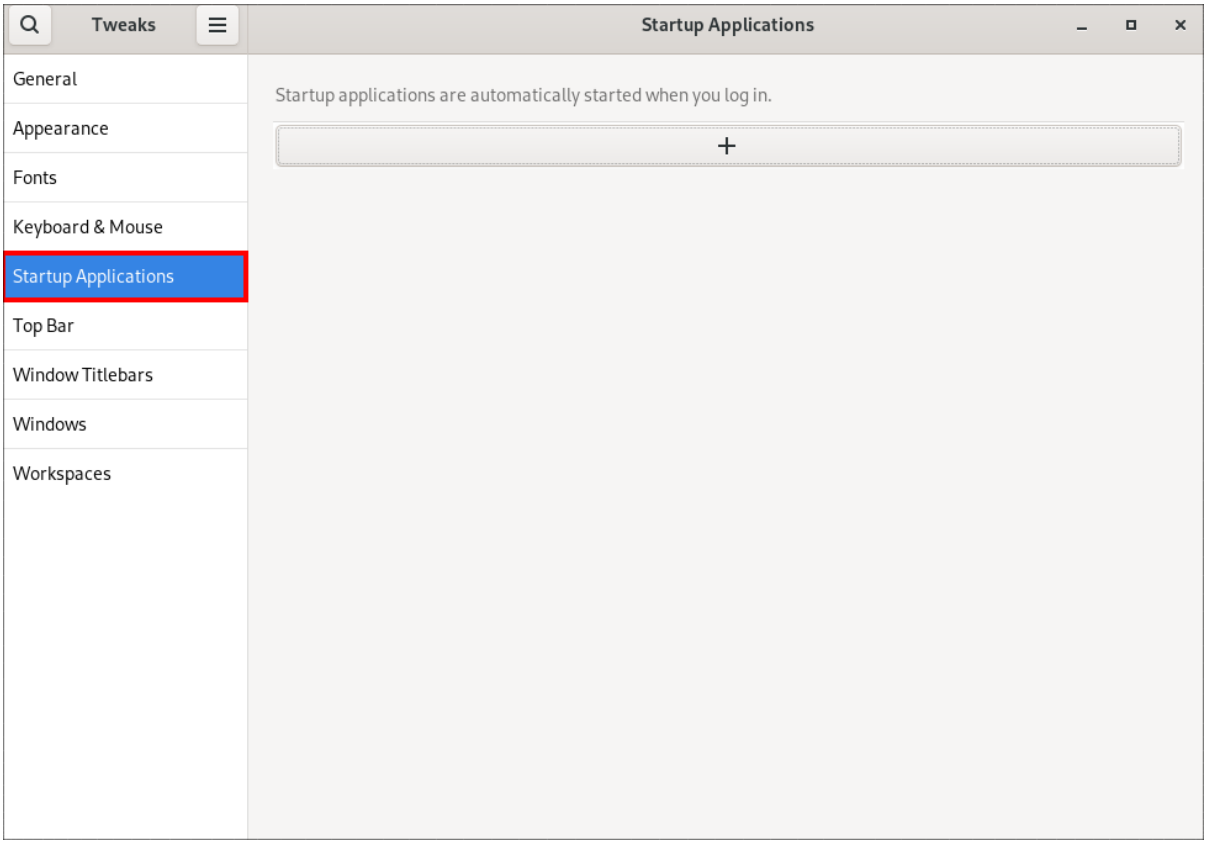
You can set applications to launch automatically on login using the **Tweaks** tool. **Tweaks** is a tool to customize the GNOME Shell environment for a particular user.

Prerequisites

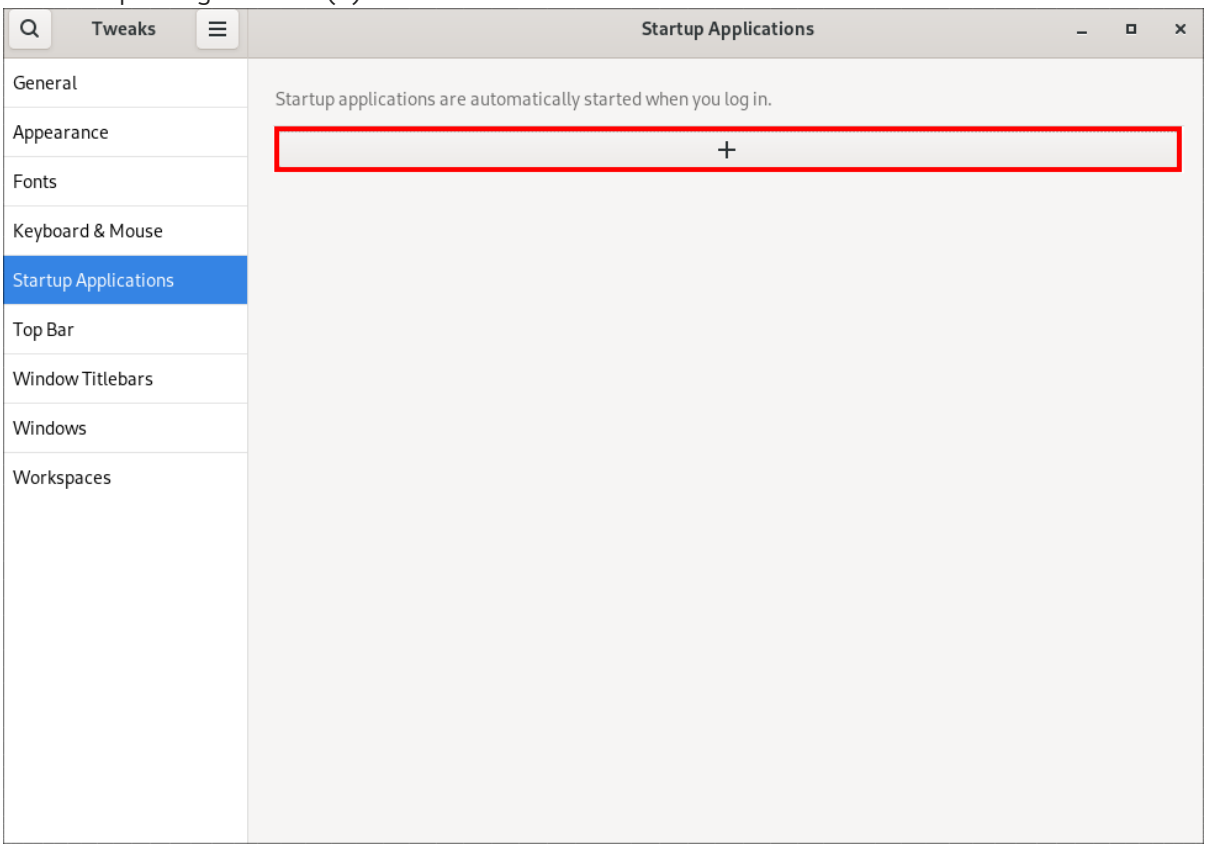
- You have installed **gnome-tweaks** on your system. For more details, see Installing software in GNOME
- You have installed the application that you want to launch at login.

Procedure

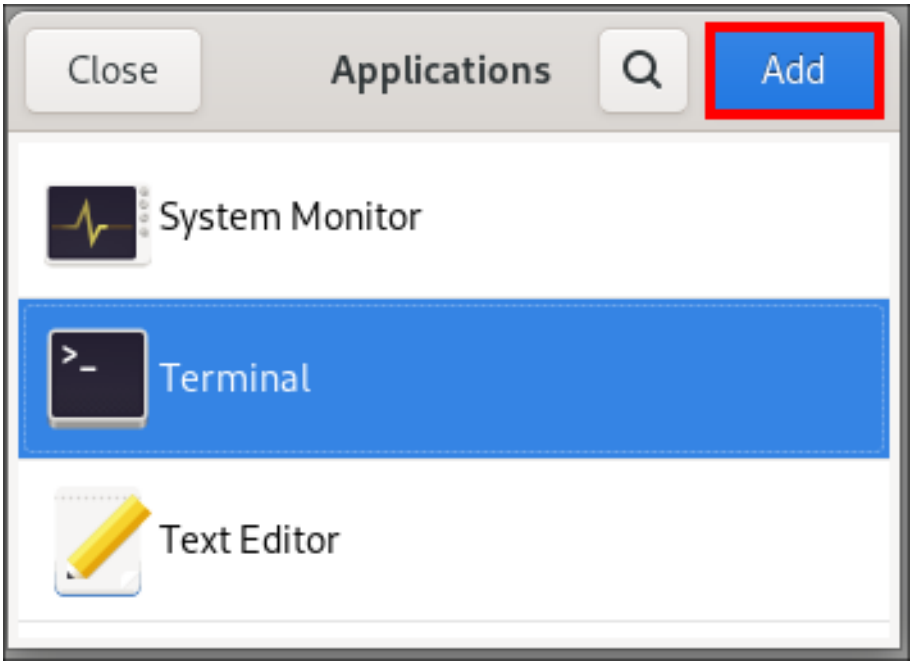
1. Open **Tweaks**. For more details see Launching applications in GNOME .
2. Select **Startup Applications** in the left side bar.



3. Click the plus sign button (**+**).

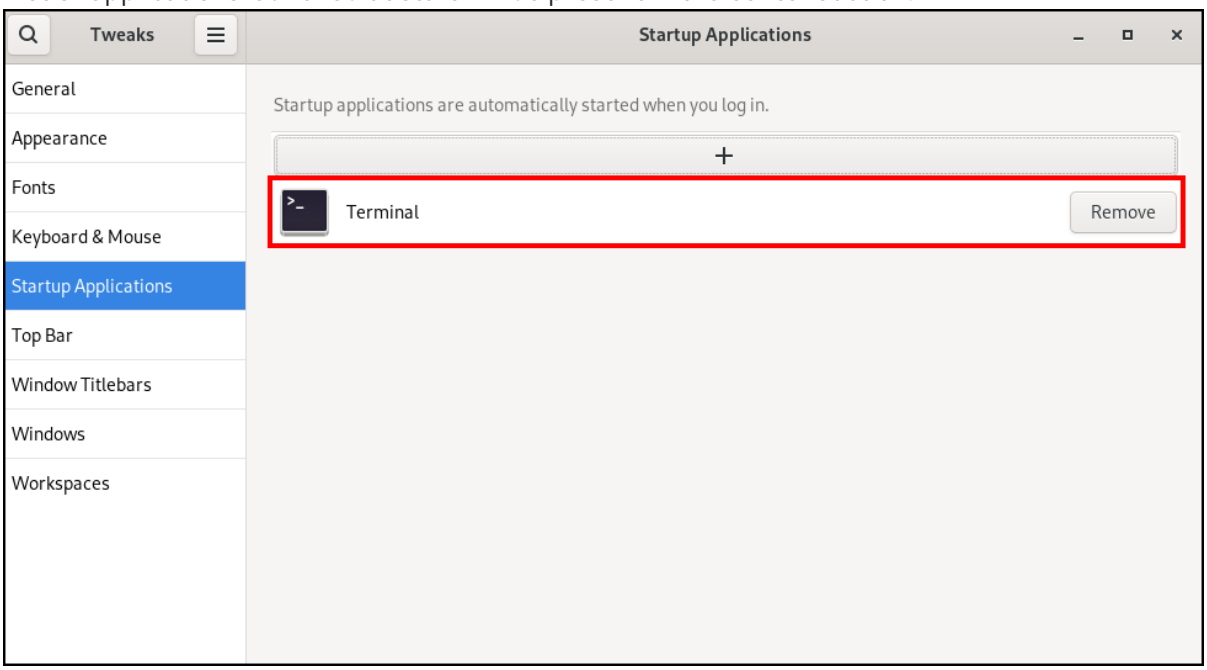


4. Select an application from the list of available applications and click **Add**.



Verification

1. Open **Tweaks**.
2. Select **Startup Applications** in the left side bar.
3. List of applications launched at start will be present in the center section.



Additional resources

- For more information about lauching applications, see Launching applications in GNOME

CHAPTER 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 upper-left corner and push the cursor to the screen corner, the **Activities Overview** menu opens automatically.

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

3.1. DISABLING HOT CORNER USING SETTINGS

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

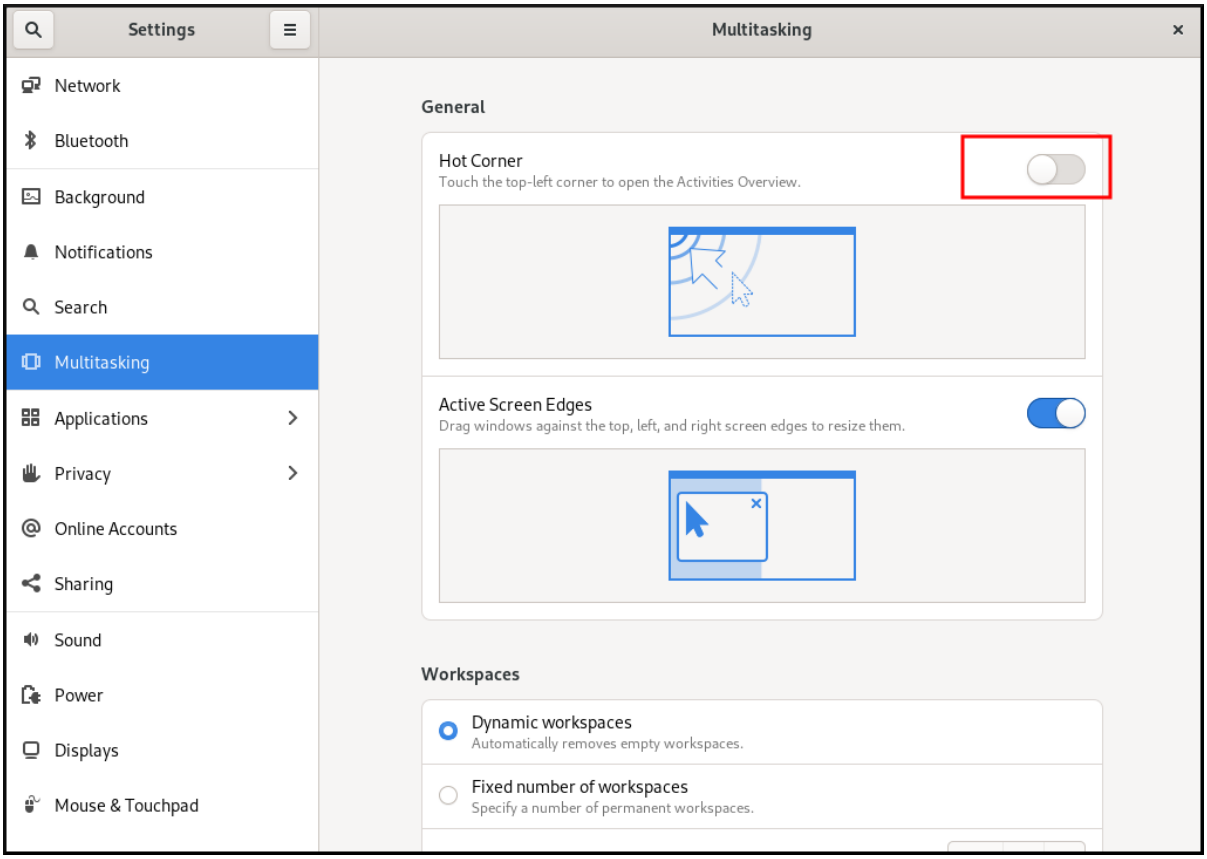
NOTE

This procedure disables the hot corner functionality for a **single** user.

Procedure

1. Open the **Settings** application by clicking the gear button.
2. In the **Settings** application, go to **Multitasking**.
3. In the **General** section, disable the **Hot Corner** button.

Disabling hot corner using the Settings application



3.2. DISABLING HOT CORNER USING GSETTINGS

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

Procedure

- 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
```

3.3. DISABLING THE HOT CORNER FUNCTIONALITY FOR ALL USERS

To disable the hot corner functionality for all users, you need to create a **dconf** profile.

Procedure

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

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

2. Create the **/etc/dconf/db/local.d/locks/00-interface** file with the following content.

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

# GSettings key names and their corresponding values
enable-hot-corners='FALSE'
```

3. Create a file in the **/etc/dconf/db/local.d/locks** directory, for example **/etc/dconf/db/local.d/locks/00-interface**, with the following content.

```
# Prevent users from changing values for the following keys:
/org/gnome/desktop/interface/enable-hot-corners
```

   The configuration file locks down the **/org/gnome/desktop/interface/enable-hot-corners** key for all users. This key controls whether the hot corner is enabled.

4. Update the system databases for the changes to take effect.

```
# dconf update
```

5. Ensure that all users log out. The changes take effect when users log back in.

CHAPTER 4. SEARCHING FOR FILES IN GNOME

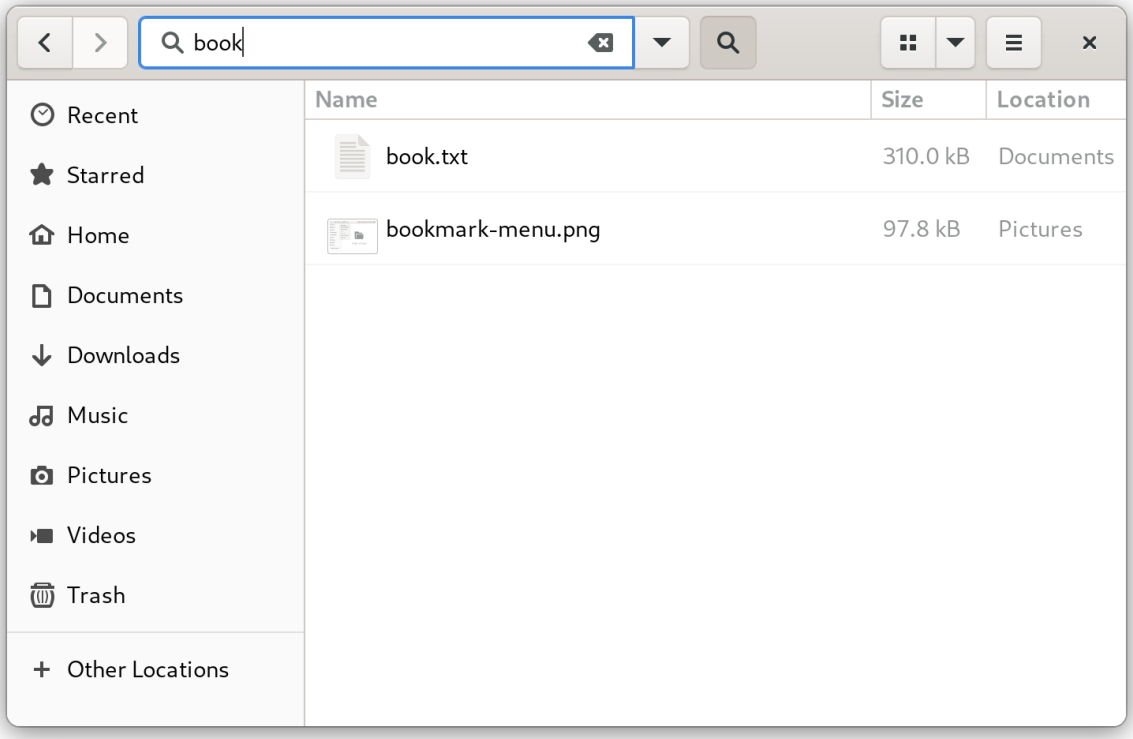
As a user in the GNOME environment, you can search for files using the **Files** application.

4.1. PERFORMING A BASIC FILE SEARCH

You can search for files in GNOME. This basic search looks for files in your home directory and all folders in it, based on a file name.

Procedure

1. Open the **Files** application.
2. Press the **Search** button.
3. In the text field, type the file name or a part of the file name that you are searching for.



4. The window now lists all files in your home directory that match the file name.

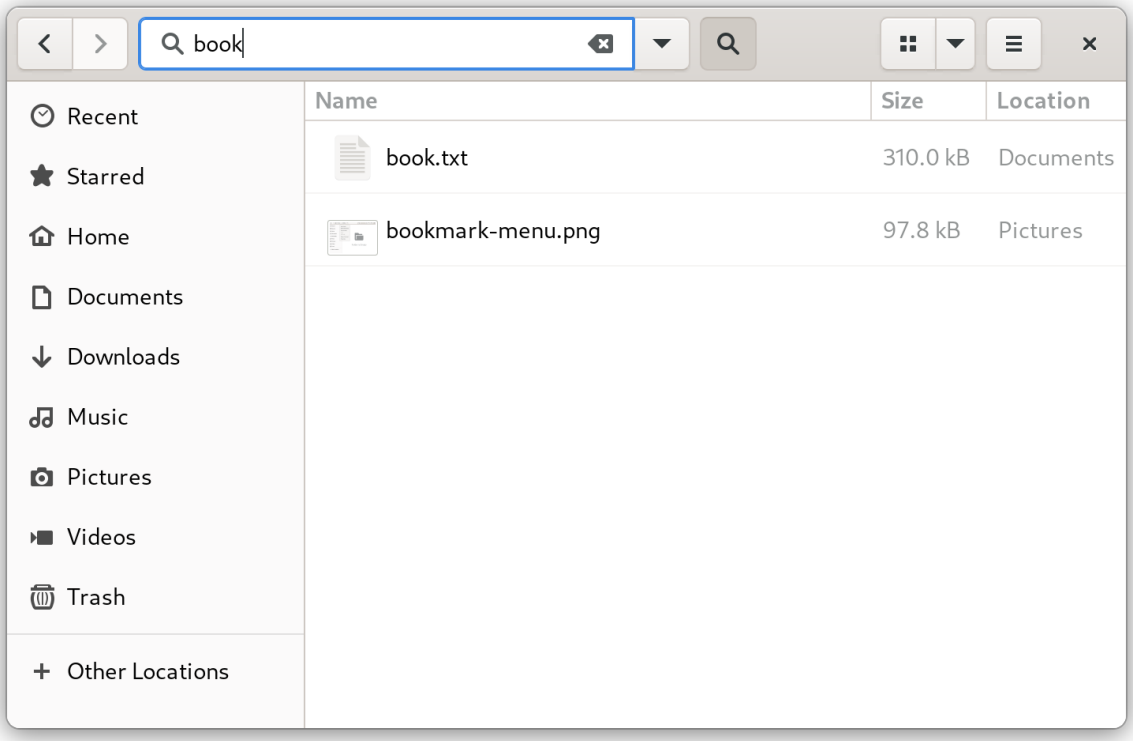
4.2. PERFORMING AN ADVANCED FILE SEARCH

You can search for files in GNOME. This advanced search looks for files in a specific location, based on a file name, a time of access, a time of modification, or a file type.

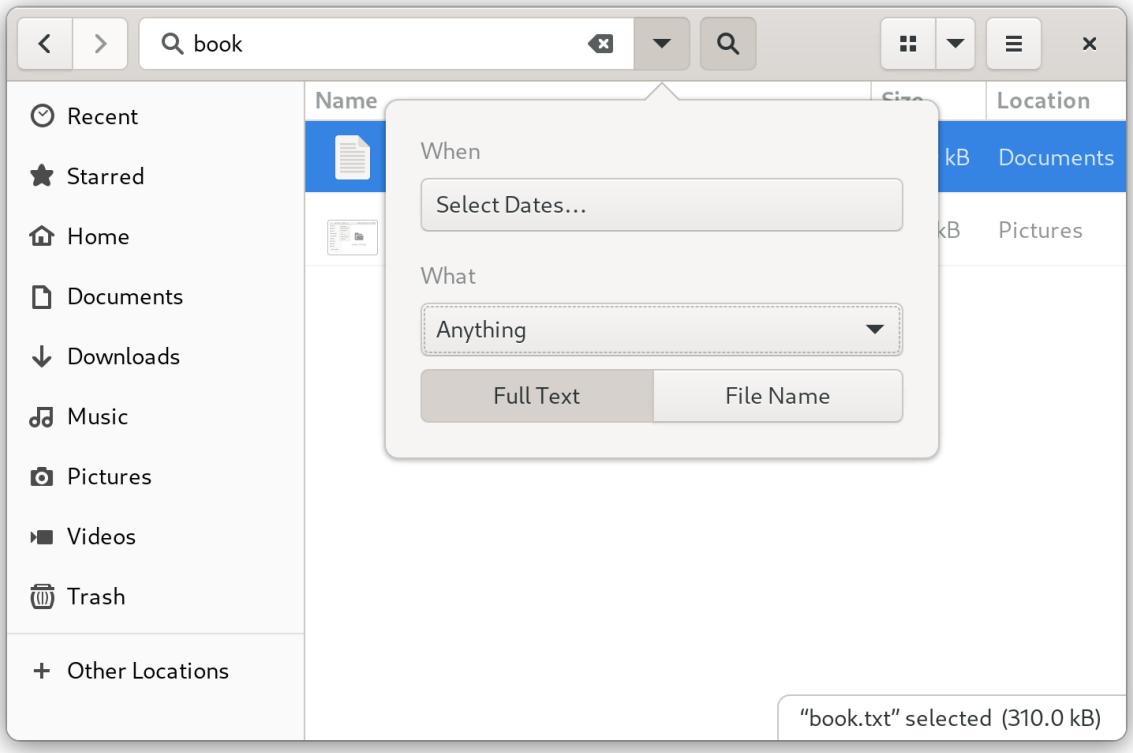
Procedure

1. Open the **Files** application.
2. Navigate to the folder where you want to search for a file.
   The search recursively descends into all folders contained in this location.
3. Press the **Search** button.

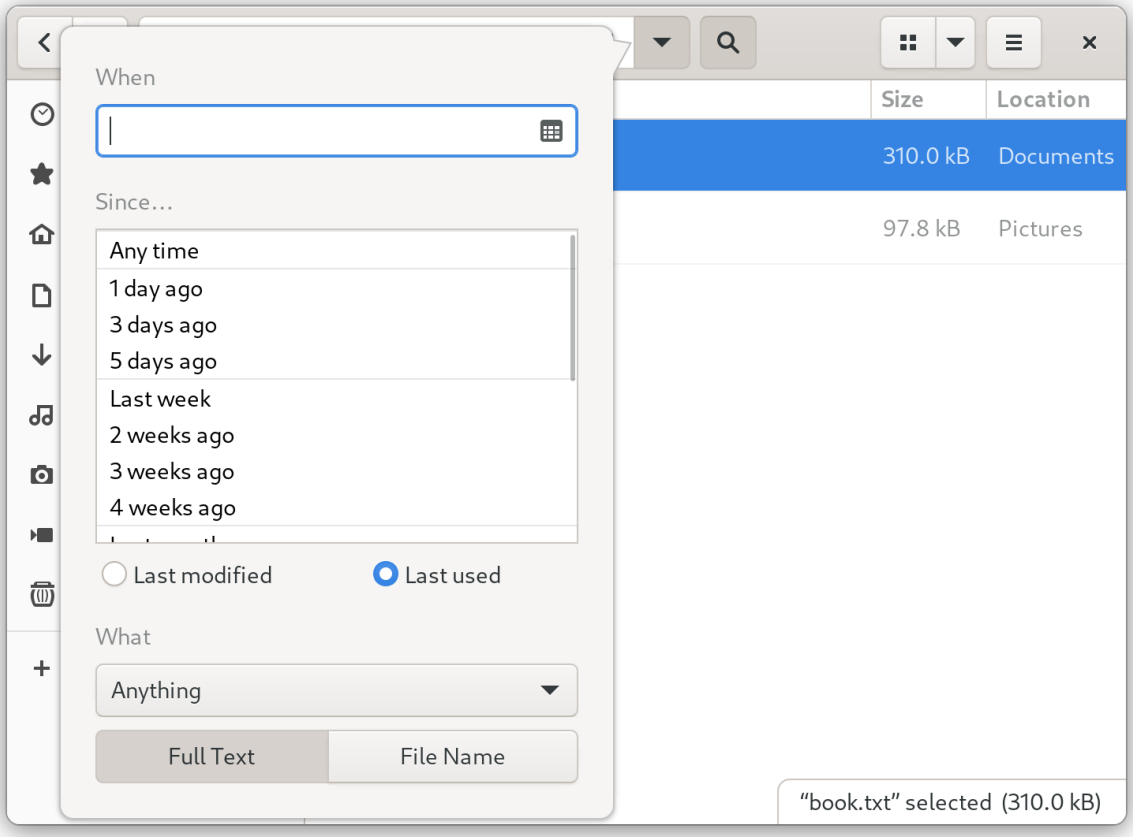
4. Optionally, type the file name or a part of the file name that you are searching for in the text field.
   If you do not provide a file name, the search lists all files that match the other criteria, regardless of their file names.



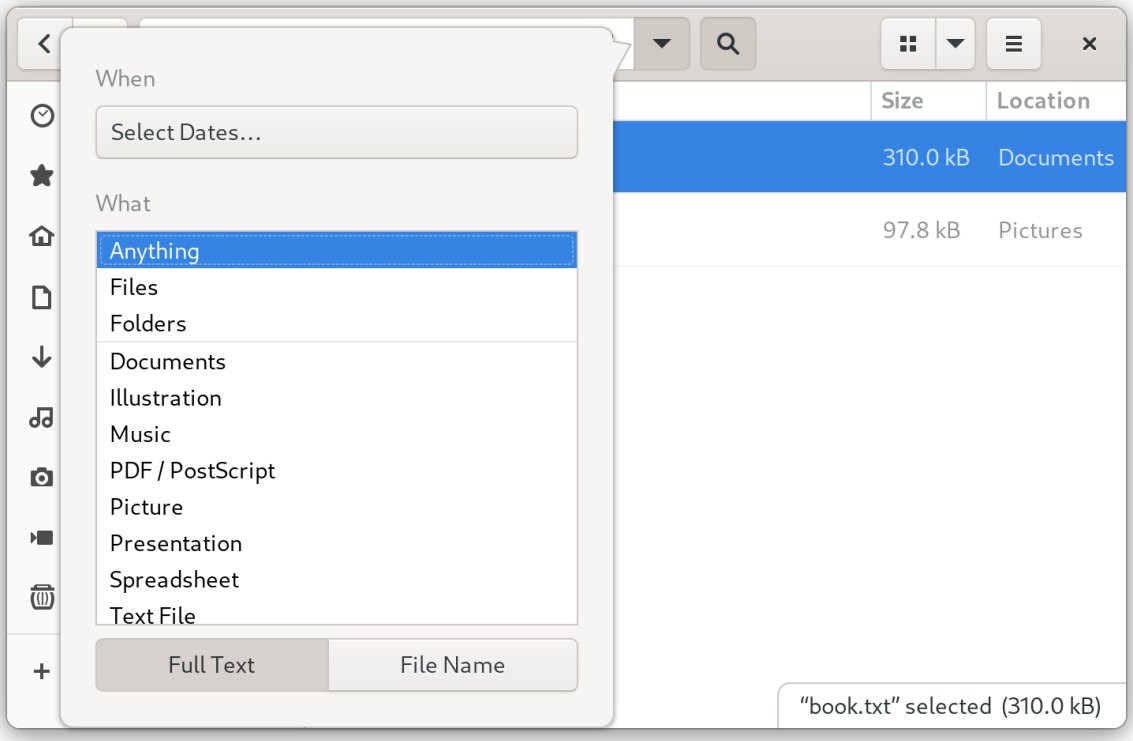
5. Click the triangle button next to the text field.
   In this menu, you can select other search criteria.



6. To specify the access or modification time, click **Select dates...** next to the **When** label. Enter a date or select a time point from the list.
   Below the time list, you can switch between **Last modified** and **Last used**.



7. To specify the file type, click **Anything** next to the **What** label. Select a file type from the list.



8. To switch between a search based on file content or file names, use the **Full Text** and **File Name** buttons, respectively.

NOTE

The full-text search only works in indexed locations. You can configure the indexed locations in the **Search** section of the **Settings** application.

9. Click the triangle button next to the text field to hide the menu.

10. The window now lists all files in the specified directory that match your search criteria.

CHAPTER 5. BOOKMARKING FILES AND LOCATIONS

In GNOME, applications and dialogs that manage files list bookmarks in the left side bar. You can add, remove, and edit the bookmarks.

5.1. ADDING A BOOKMARK

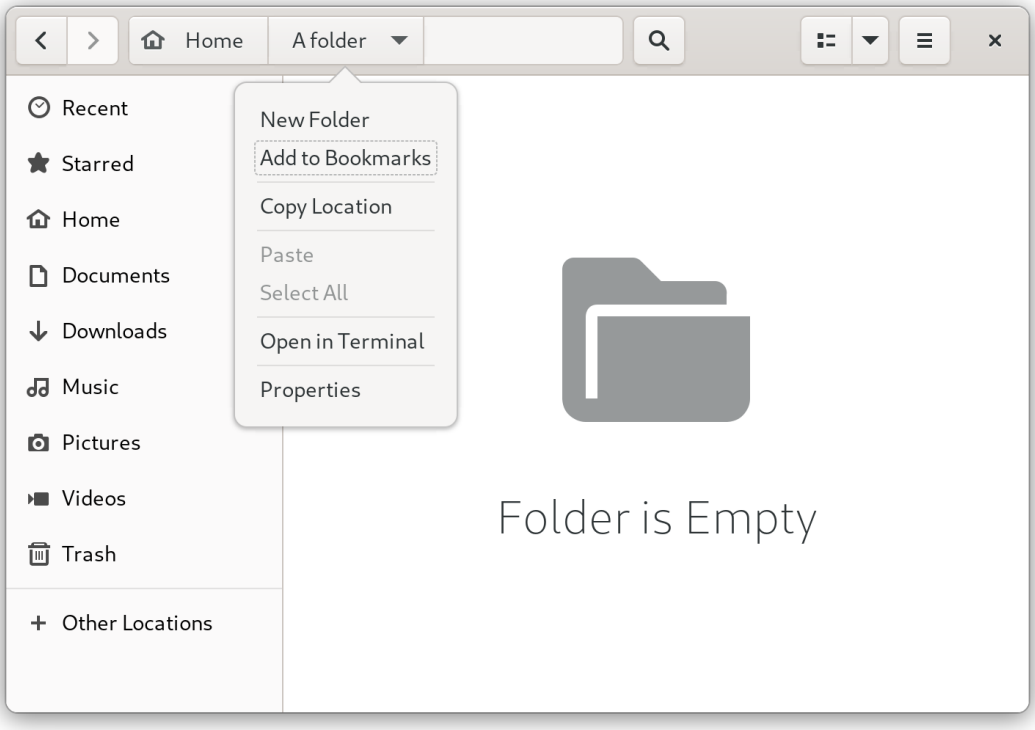
You can save a reference to a folder by bookmarking it in the **Files** application.

Prerequisite

- Locate the folder in the **Files** application.

Procedure

- Add the folder to bookmarks using either of the following methods:
  - By dragging:
    i. Drag the folder to the left side bar.
    ii. Drop it over the **New bookmark** item.
  - Using a keyboard shortcut:
    i. Open the folder.
    ii. Press **Ctrl**+**D**.
  - Using a menu:
    i. Open the folder.
    ii. In the navigation bar at the top of the window, click the name of the folder.



iii. Select **Add to Bookmarks**.

Verification

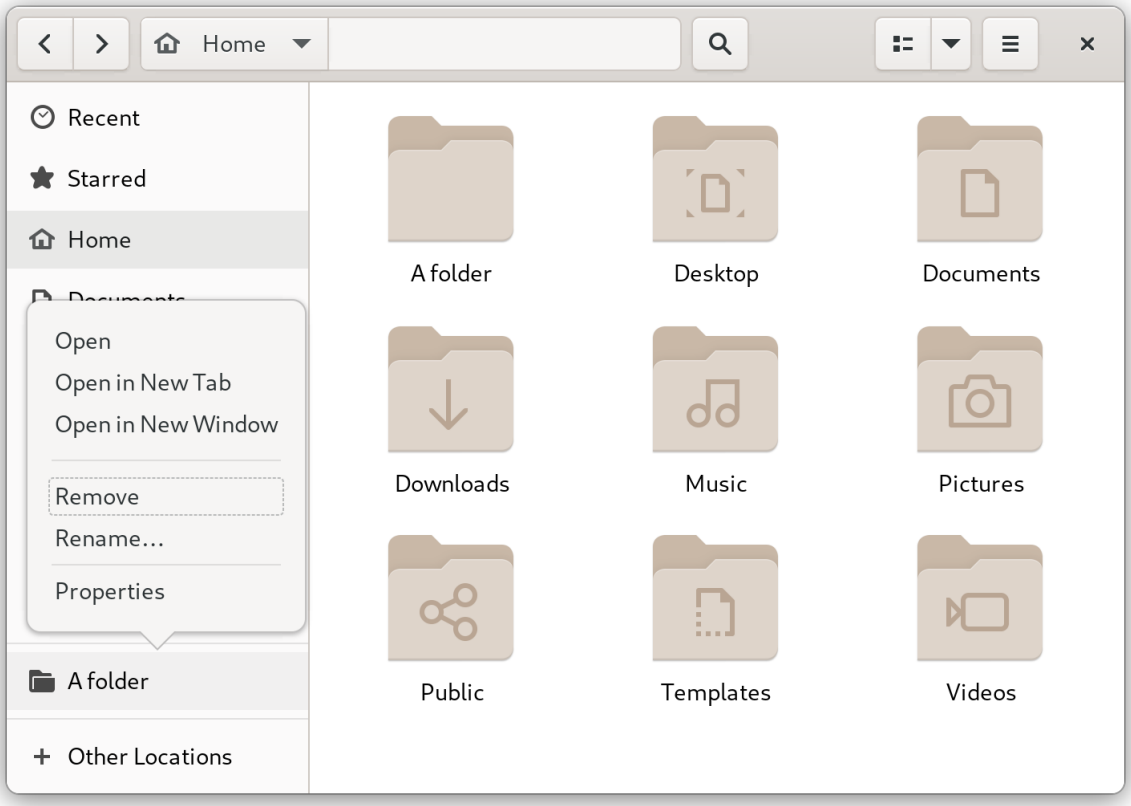
- Check that the bookmark now appears in the side bar.

5.2. REMOVING A BOOKMARK

You can delete an existing bookmark in the **Files** application.

Procedure

1. Right-click the bookmark in the side bar.
2. Select **Remove** from the menu.



Verification

- Check that the bookmark no longer appears in the side bar.

5.3. RENAMING A BOOKMARK

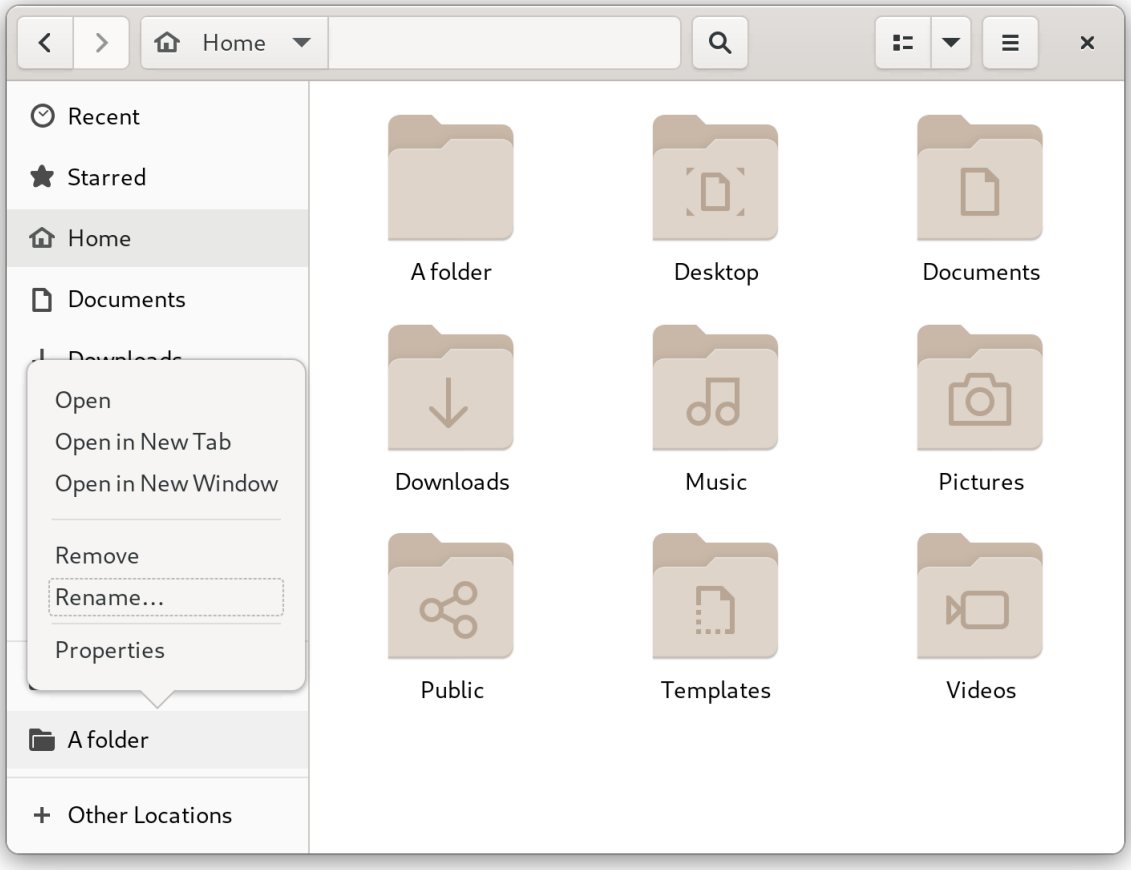
You can rename a bookmark to distinguish it from other bookmarks. If you have bookmarks to several folders that all share the same name, you can tell the bookmarks apart if you rename them.

Renaming the bookmark does not rename the folder.

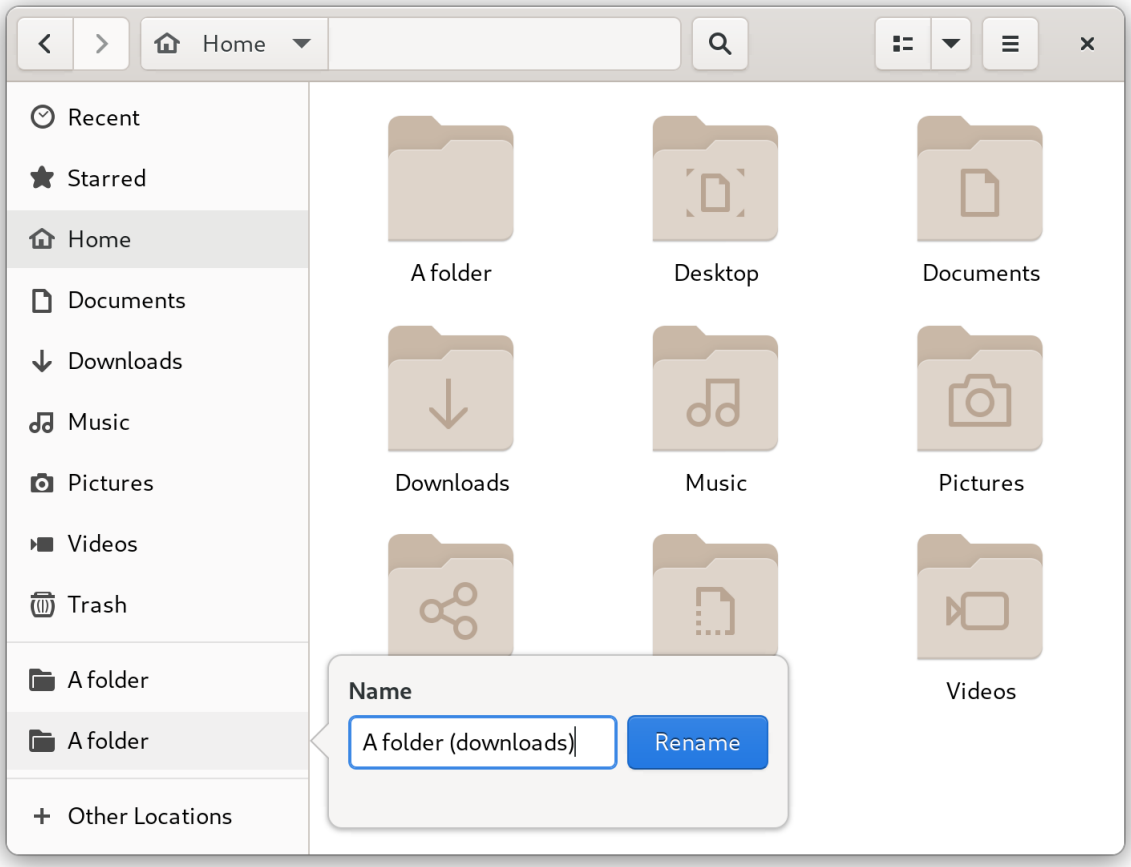
Procedure

1. Right-click the bookmark in the side bar.

2. Select **Rename...**.



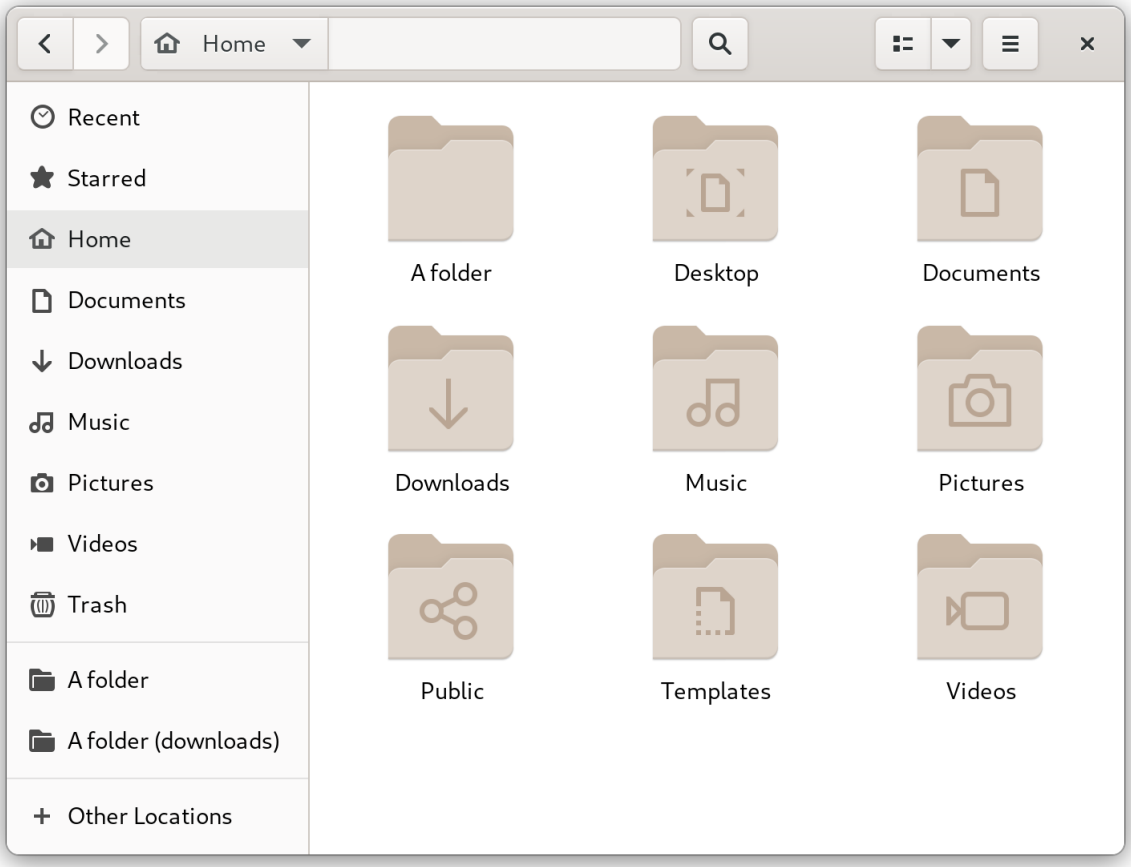
3. In the **Name** field, enter the new name for the bookmark.



4. Click **Rename**.

Verification

- Check that the side bar lists the bookmark under the new name.



5.4. ADDING A BOOKMARK FOR ALL USERS

As a system administrator, you can set a bookmark for several users at once so that file shares are easily accessible to all the users.

Procedure

1. In the home directory of each existing user, edit the ***~user*/.config/gtk-3.0/bookmarks** file.
2. In the file, add a Uniform Resource Identifiers (URI) line that identifies the bookmark.
   For example, the following lines add bookmarks to the **/usr/share/doc/** directory and to the GNOME FTP network share:

   ```
   file:///usr/share/doc/
   ftp://ftp.gnome.org/
   ```

3. Optional: To also add the bookmarks for every newly created user on the system:
   a. Create the **/etc/skel/.config/gtk-3.0/bookmarks** file.
   b. Enter the bookmark URI lines in the file.

CHAPTER 6. TYPING EMOJI CHARACTERS

You can type emoji characters using several different methods in GNOME, depending on the type of the application.

6.1. TYPING EMOJI CHARACTERS IN GTK APPLICATIONS

This procedure inserts an emoji character in an application that uses the GTK graphical toolkit, such as in native GNOME applications.

Prerequisites

- Make sure that the application is built on the GTK toolkit.

Procedure

1. Open a GTK application.
2. Make sure that a text field is active.
3. Press **Ctrl**+**;**.
   The emoji selection menu opens.
4. Browse the emoji characters or type a keyword that identifies the emoji character that you want to insert, such as **smile**.
   For the full list of keywords associated with emoji characters, see the *Other Keywords* column on the Emoji List page.
5. Click the selected character, or navigate to it using the cursor keys and press **Enter**.

Verification

- Check that the intended emoji character now appears at your cursor.

6.2. TYPING EMOJI CHARACTERS IN ANY APPLICATIONS

This procedure inserts an emoji character in any application, regardless of the graphical toolkit that the application uses.

Procedure

1. Open an application.
2. Make sure that a text field is active.
3. Press **Ctrl**+**.**.
   The underscored letter **e** appears at your cursor.
4. Type a keyword that identifies the emoji character that you want to insert, such as **smile**.
   For the full list of keywords associated with emoji characters, see the *Other Keywords* column on the Emoji List page.
5. Repeatedly press **Space** to browse the emoji characters that match your keyword.

6. Confirm the selected emoji character by pressing **Enter**.

Verification

- Check that the intended emoji character now appears at your cursor.

CHAPTER 7. ENABLING CHINESE, JAPANESE, OR KOREAN TEXT INPUT

If you write with Chinese, Japanese, or Korean characters, you can configure RHEL to input text in your language.

7.1. INPUT METHODS

Certain scripts, such as Chinese, Japanese, or Korean, require keyboard input to go through an Input Method Engine (IME) to enter native text.

An input method is a set of conversion rules between the text input and the selected script. An IME is a software that performs the input conversion specified by the input method.

To input text in these scripts, you must set up an IME. If you installed the system in your native language and selected your language at the **GNOME Initial Setup** screen, the input method for your language is enabled by default.

7.2. AVAILABLE INPUT METHOD ENGINES

The following input method engines (IMEs) are available on RHEL from the listed packages:

Table 7.1. Available input method engines

Languages	Scripts	IME name	Package
Chinese	Simplified Chinese	Intelligent Pinyin	**ibus-libpinyin**
Chinese	Traditional Chinese	New Zhuyin	**ibus-libzhuyin**
Japanese	Kanji, Hiragana, Katakana	Anthy	**ibus-anthy**
Korean	Hangul	Hangul	**ibus-hangul**
Other	Various	M17N	**ibus-m17n**

7.3. INSTALLING INPUT METHOD ENGINES

This procedure installs input method engines (IMEs) that you can use to input Chinese, Japanese, and Korean text.

Procedure

- Install all available input method packages:

```
# dnf install @input-methods
```

7.4. SWITCHING THE INPUT METHOD IN GNOME

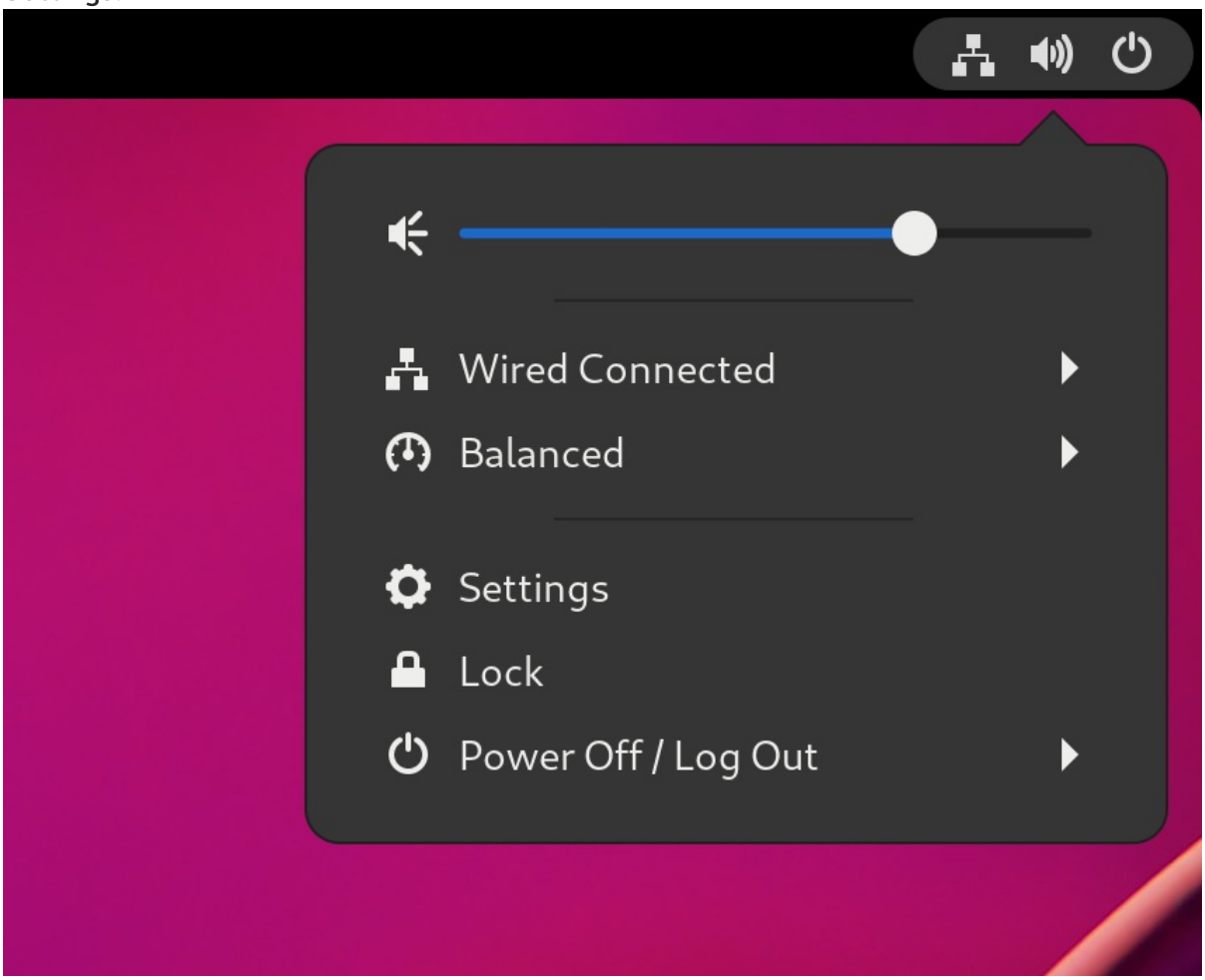
This procedure sets up the input method for your script, such as for Chinese, Japanese, or Korean scripts.

Prerequisites

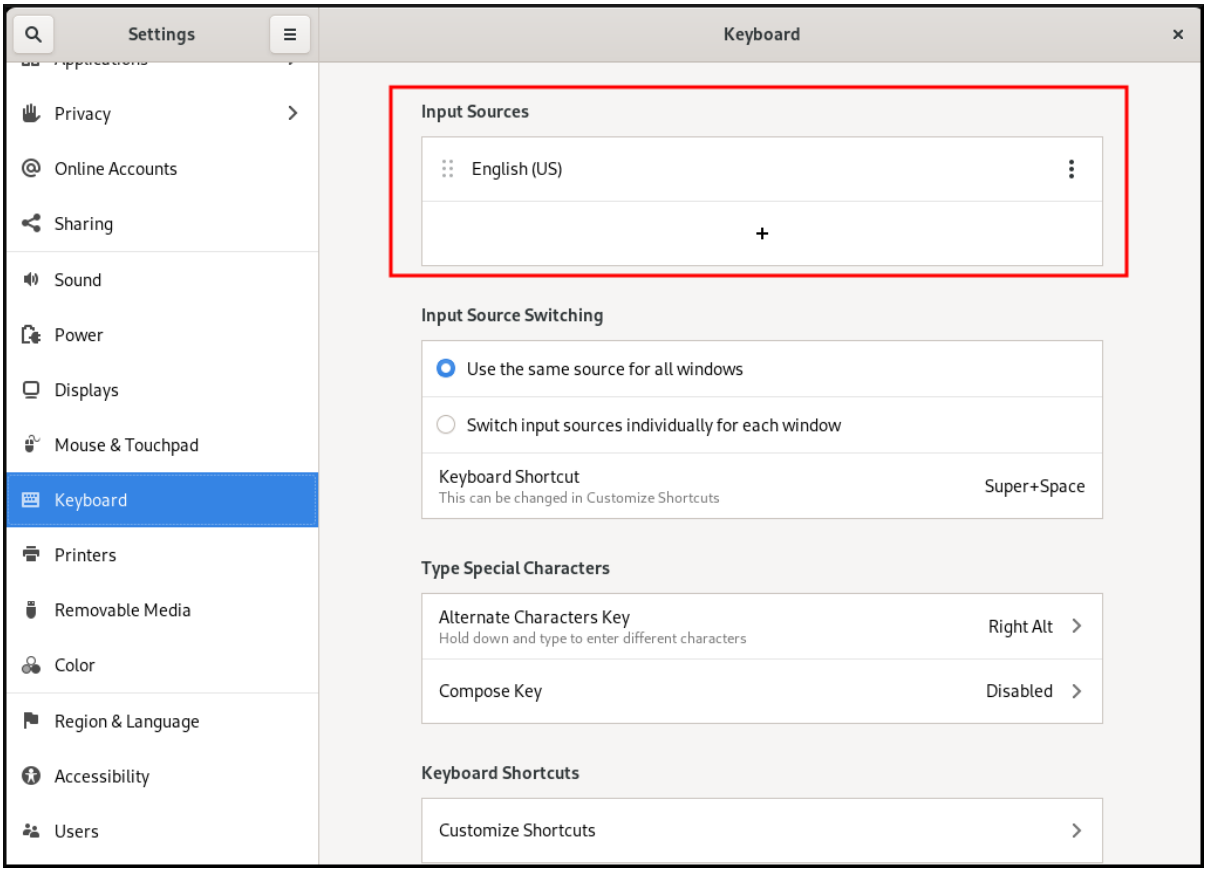
- The input method packages are installed.

Procedure

1. Go to the **system menu**, which is accessible from the top-right screen corner, and click **Settings**.

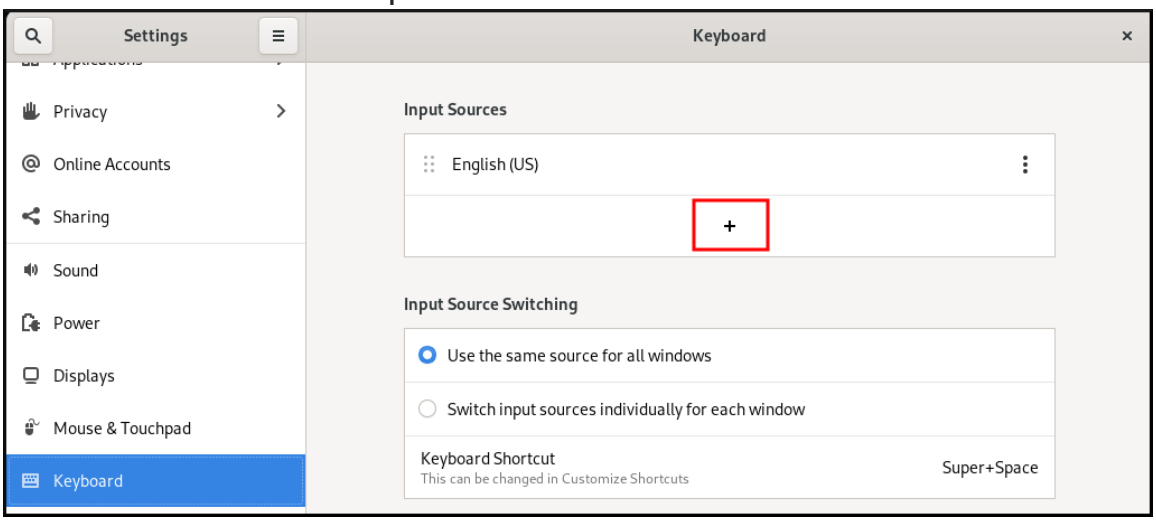


2. Select the **Keyboard** section.
3. In the **Input Sources** list, review the currently enabled input methods.

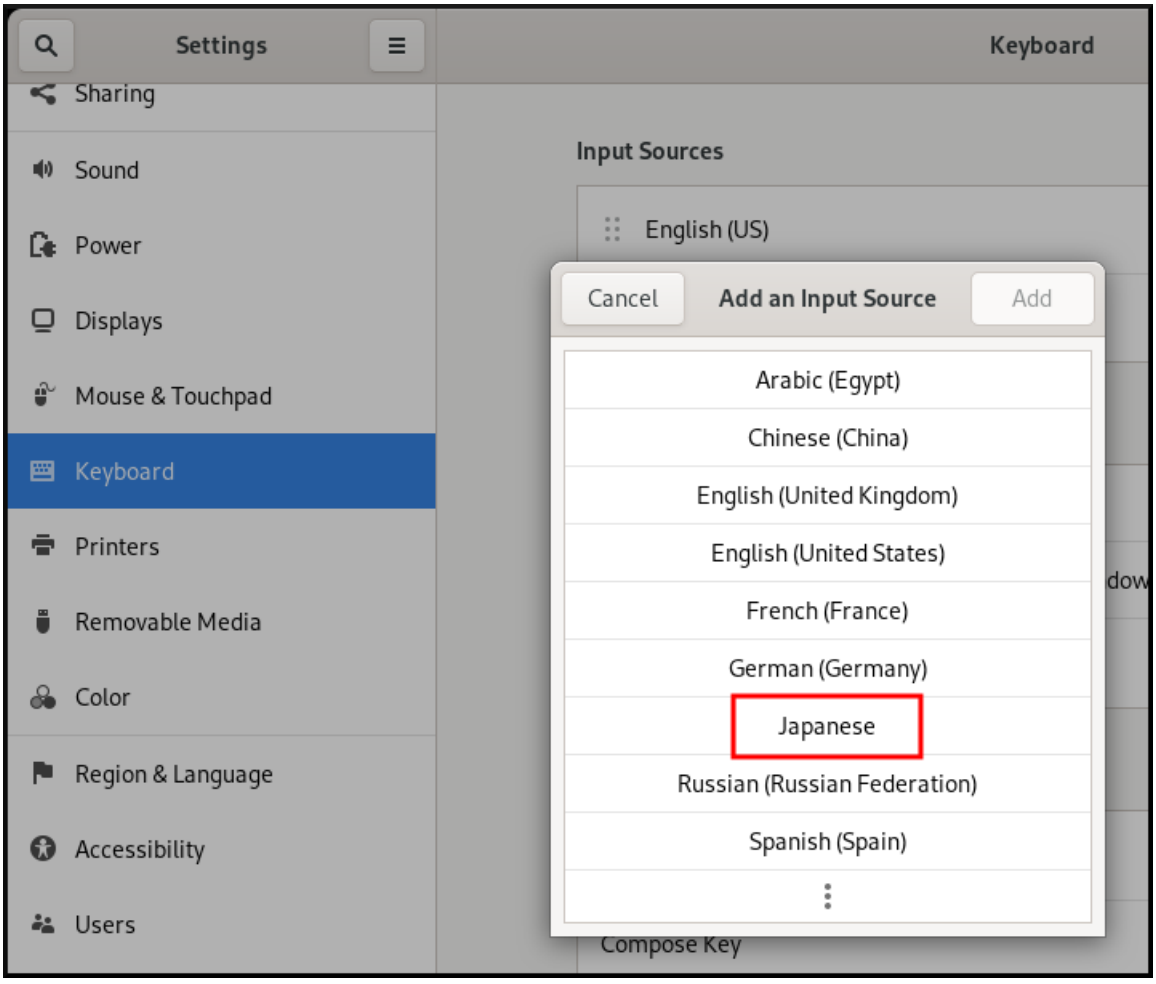


4. If your input method is missing:

   a. Click the **+** button under the **Input Sources** list.



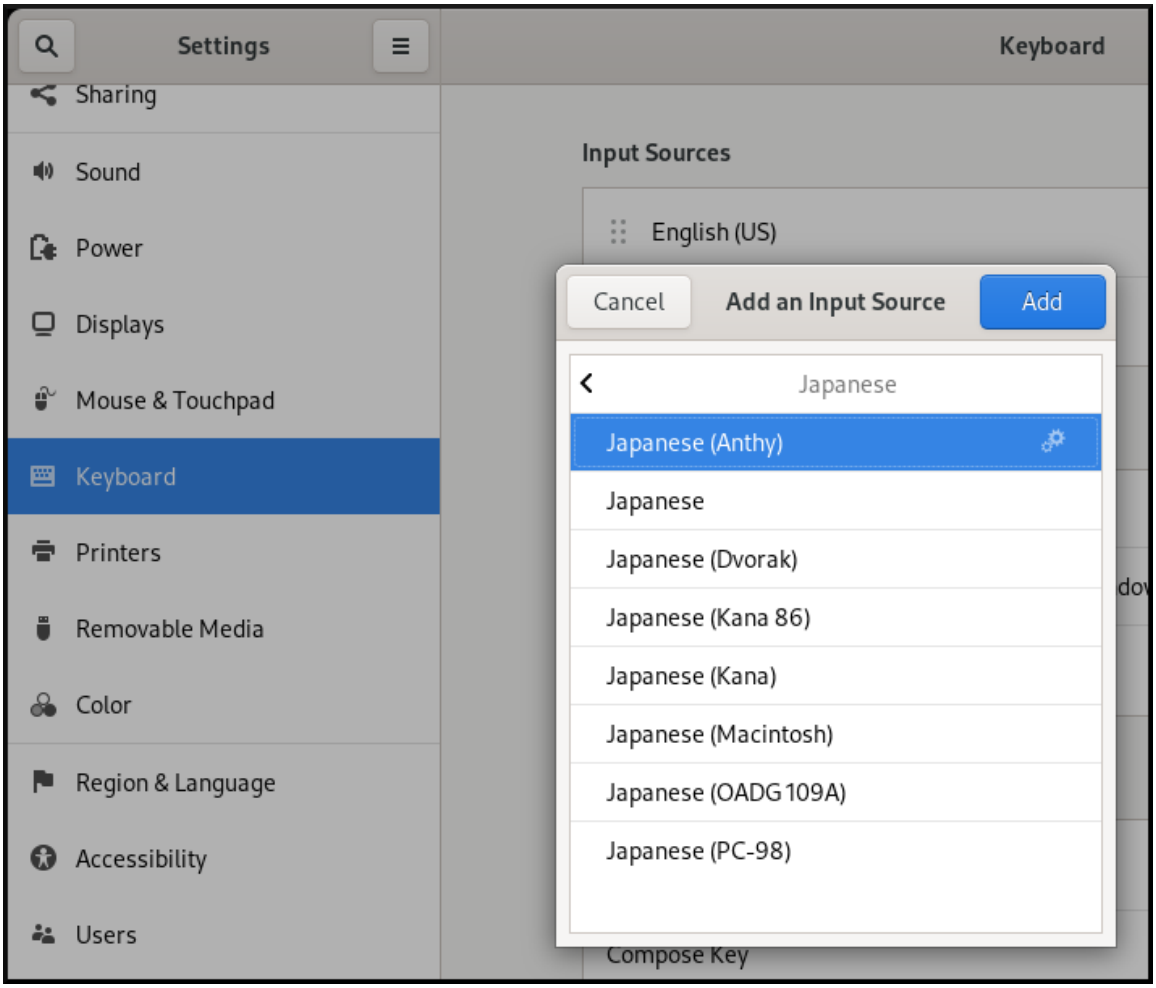
   b. Select your language.



NOTE

If you cannot find your language in the menu, click the three dots icon (**More...**) at the end of the menu.

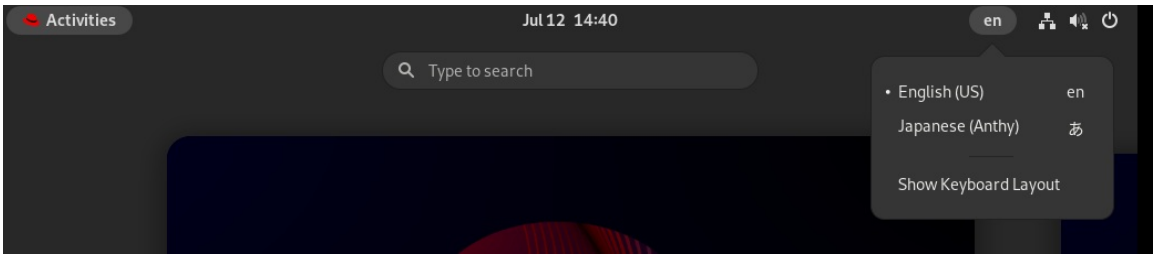
c. Select the input method that you want to use. A cog wheel icon marks all input methods to distinguish them from simple keyboard layouts.



d. Confirm your selection by clicking **Add**.

5. Switch the active input method using one of the following ways:

- Click the input method indicator on the right side of the top panel and select your input method.



- Switch between the enabled input methods using the **Super**+**Space** keyboard shortcut.

Verification

1. Open a text editor.
2. Type text in your language.
3. Verify that the text appears in your native script.

7.5. ADDITIONAL RESOURCES

- Installing a font for the Chinese standard GB 18030 character set

CHAPTER 8. GNOME SCREEN RECORDING

GNOME Screen Recording is a built-in feature in the GNOME desktop environment that allows users to record their desktop or specific application activities. The recordings are saved as video files in the WebM format.

Procedure

1. To start the recording, press the **Ctrl**+**Alt**+**Shift**+**R** keyboard shortcut.
   Once the recording begins, a red circle indicator appears in the upper-right corner of the screen, indicating that the recording is active.

2. To stop the recording, press the same **Ctrl**+**Alt**+**Shift**+**R** keyboard shortcut again.
   The red circle indicator disappears, signaling the end of the recording.

The recorded video files are saved in the **~/Videos** directory. The filenames of recorded videos start with **Screencast** and include the date and time of the recording.

CHAPTER 9. ENABLING AUTHENTICATION WITH ENTERPRISE CREDENTIALS IN GNOME

If your workplace uses a system called Active Directory or IPA, and you have an account there, you can use that account to log into the GNOME desktop environment.

Logging in using enterprise credentials provides centralized account management, streamlines access to work-related resources, and gives the convenience of Single Sign-On (SSO).

9.1. CONFIGURING ENTERPRISE CREDENTIALS IN GNOME

You can configure your system to use enterprise credentials using Settings.

Procedure

1. Open **Settings**.
2. Click **Online Accounts**.
3. Select **Enterprise Login (Kerberos)**.
4. In the **Principal** field, enter your domain username in the **username@domain.com** format.
5. Click **Connect**.
6. Enter your enterprise password and click **Continue**.
   Depending on the configuration of your domain, you might be asked for the domain administrator credentials.

9.2. ADDING ENTERPRISE USERS IN GNOME

You can add an enterprise user to GNOME using Settings.

Prerequisites

- Administrative access.
- You have configured Enterprise credentials .

Procedure

1. Open **Settings**.
2. Click **Users**.
3. Select the **Unlock** button and enter your password.
4. Click **Add User**.
5. Choose **Enterprise Login**
6. Enter the domain, username, and password for your Enterprise account.
7. Click **Add**.

Depending on the domain configuration, you might need to enter administrator credentials.

9.3. LOGGING IN TO GNOME WITH ENTERPRISE CREDENTIALS

If your network has an Active Directory or IPA domain available, and you have a domain account, you can log in to GNOME using your enterprise credentials.

Procedure

- At the GNOME login prompt, type your domain username followed by an **@** sign and then your domain name.

```
username@domain.com
```

9.4. ADDITIONAL RESOURCES

- For troubleshooting, see the **realm** man page

CHAPTER 10. REMOTELY ACCESSING THE DESKTOP AS A SINGLE USER

You can remotely connect to the desktop on a RHEL server using graphical GNOME applications. Only a single user can connect to the desktop on the server at a given time.

10.1. ENABLING DESKTOP SHARING ON THE SERVER USING GNOME

This procedure configures a RHEL server to enable a remote desktop connection from a single client.

Prerequisites

- The GNOME Remote Desktop service is installed:

```
# dnf install gnome-remote-desktop
```

Procedure

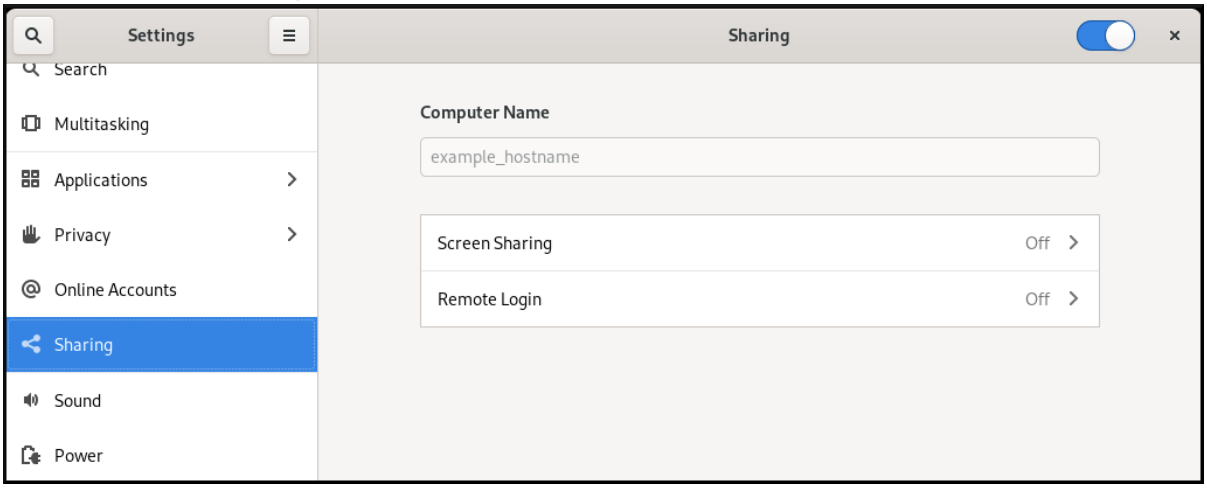
1. Configure a firewall rule to enable VNC access to the server:

```
# firewall-cmd --permanent --add-service=vnc-server
success
```

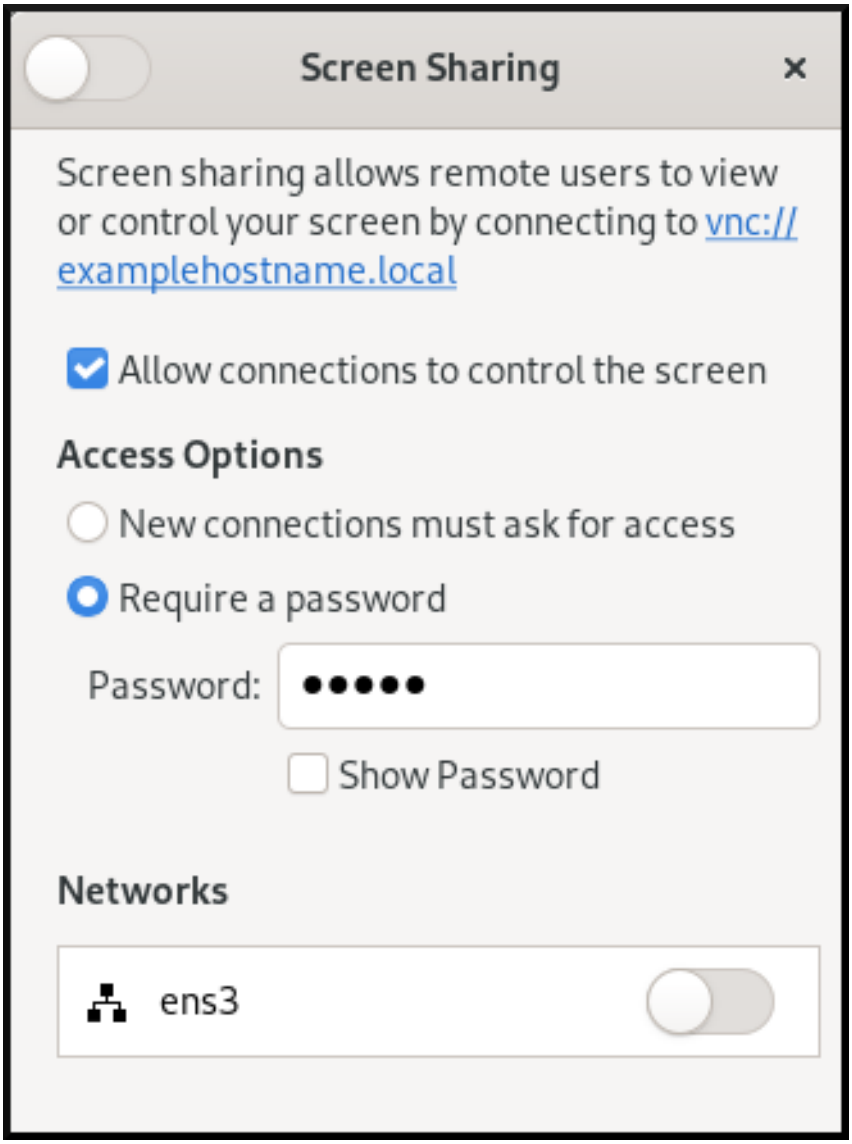
2. Reload firewall rules:

```
# firewall-cmd --reload
success
```

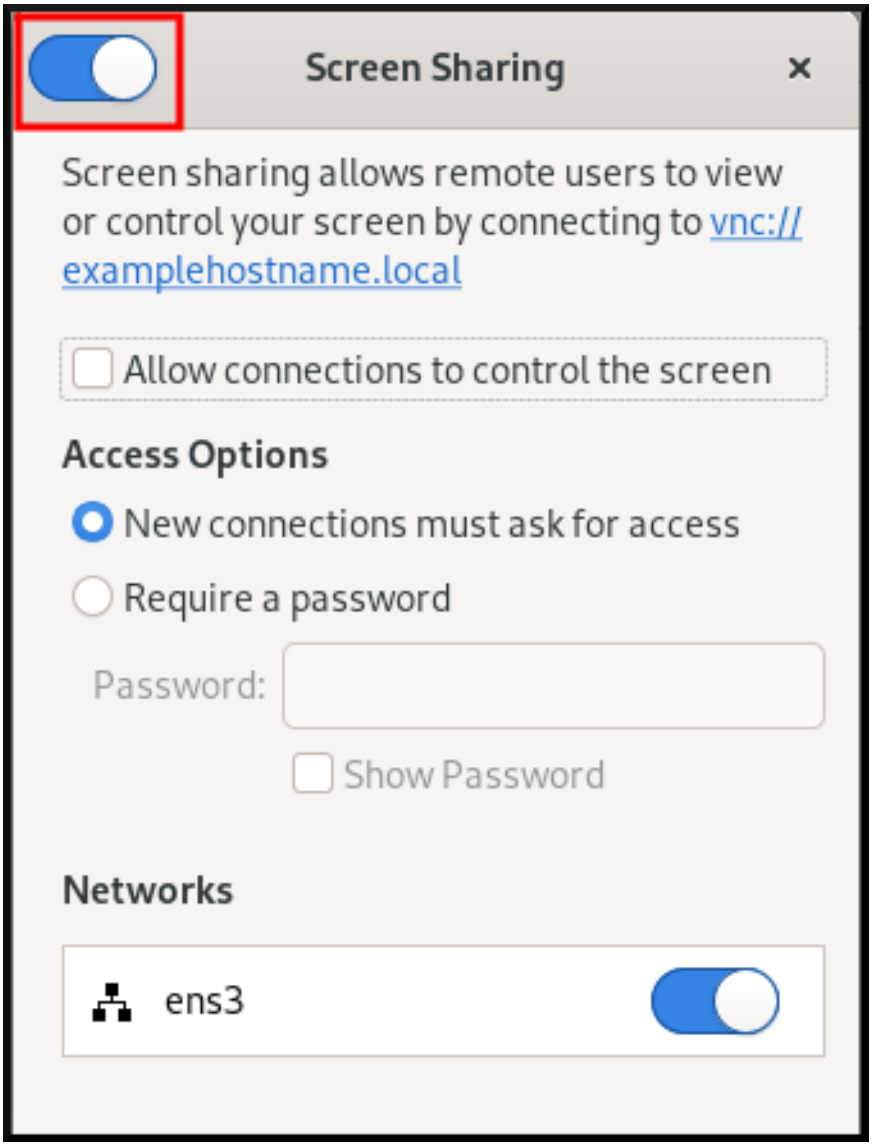
3. Open **Settings** in GNOME.
4. Navigate to the **Sharing** menu:



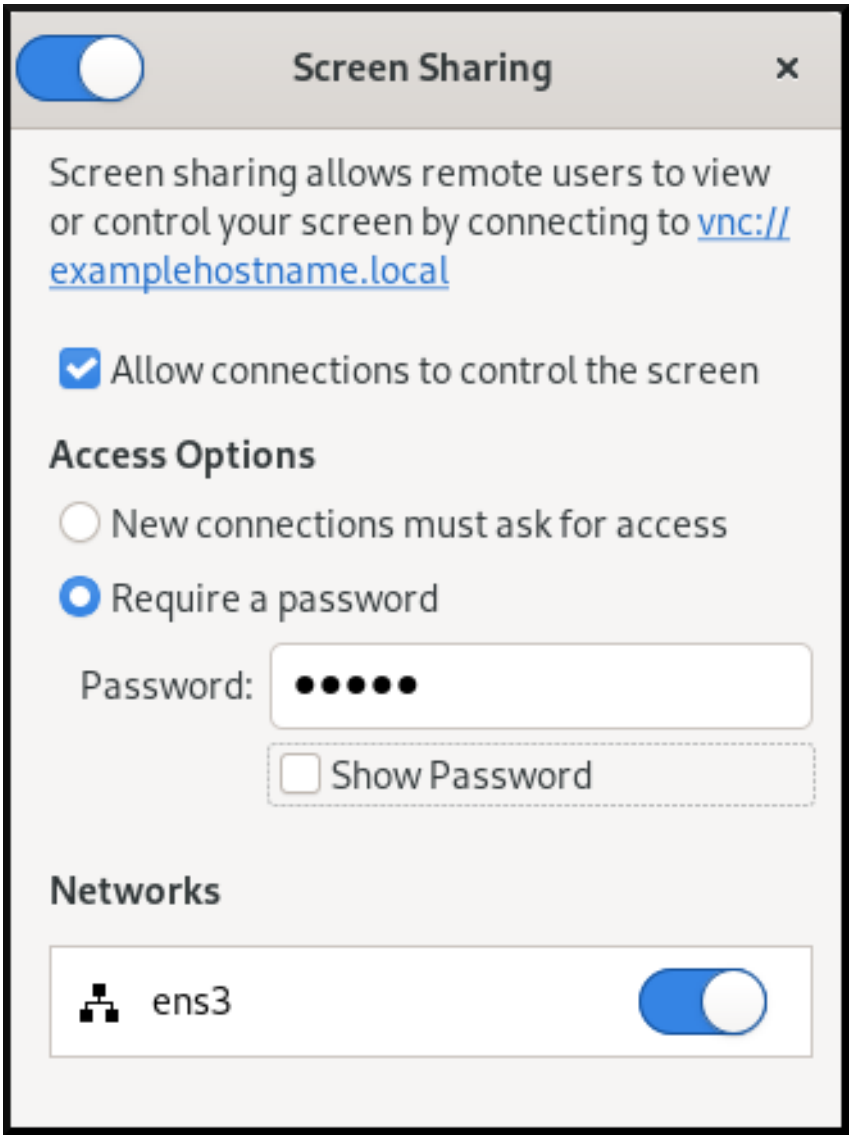
5. Click **Screen Sharing**.
   The screen sharing configuration opens:



6. Click the switch button in the window header to enable screen sharing:



7. Select the **Allow connections to control the screen**check box.
8. Under **Access Options**, select the **Require a password** option.
9. Set a password in the **Password** field.
   Remote clients must enter this password when connecting to the desktop on the server.



10.2. CONNECTING TO A SHARED DESKTOP USING GNOME

This procedure connects to a remote desktop session using the **Connections** application. It connects to the graphical session of the user that is currently logged in on the server.

Prerequisites

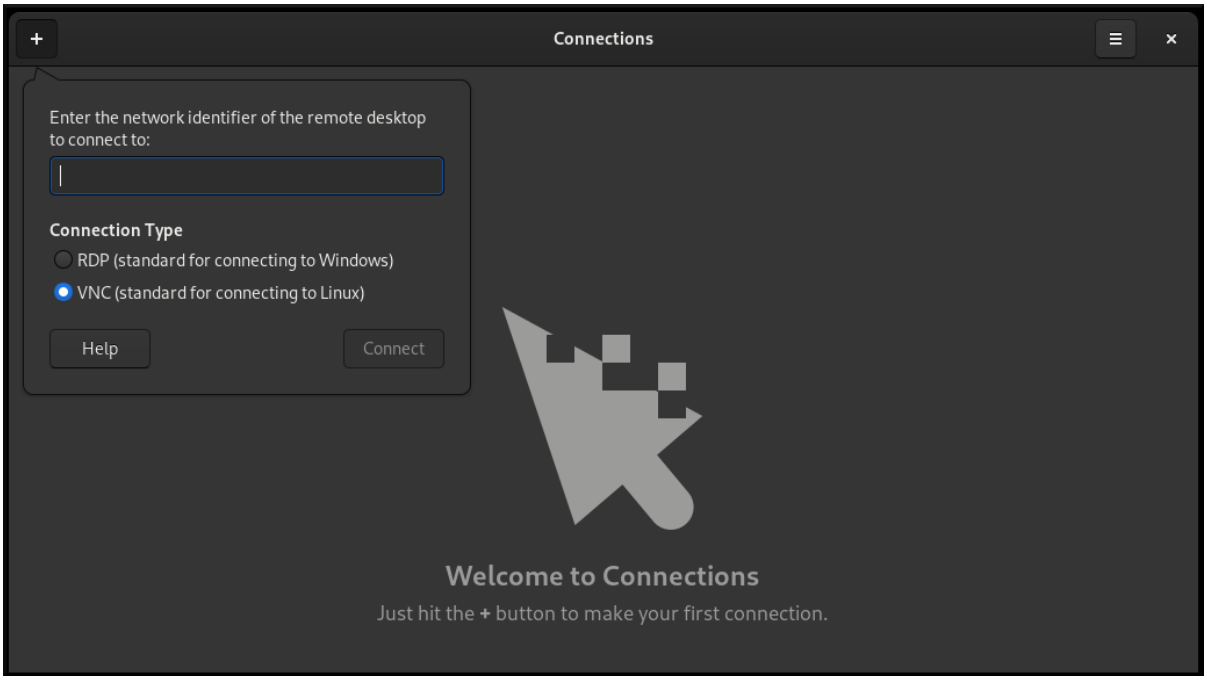
- A user is logged into the GNOME graphical session on the server.
- The desktop sharing is enabled on the server.

Procedure

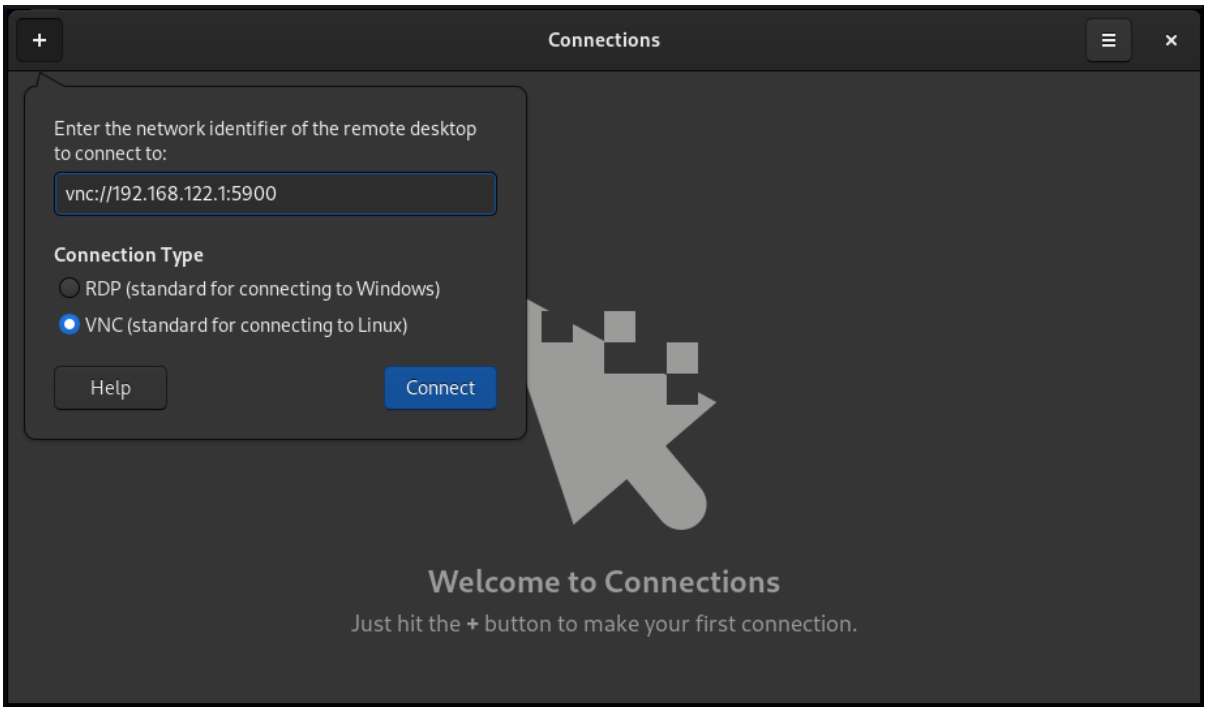
1. Install the **Connections** application on the client:

```
# dnf install gnome-connections
```

2. Launch the **Connections** application.
3. Click the **+** button to open a new connection.



4. Enter the IP address of the server.



5. Choose the connection type based on the operating system you want to connect to.
6. Click **Connect**.

Verification steps

1. On the client, check that you can see the shared server desktop.
2. On the server, a screen sharing indicator appears on the right side of the top panel:

You can control the screen sharing in the system menu.

10.3. DISABLING ENCRYPTION IN GNOME VNC

You can disable encryption in the GNOME remote desktop solution. This enables VNC clients that do not support the encryption to connect to the server.

Procedure

1. As the server user, set the **encryption** key of **org.gnome.desktop.remote-desktop.vnc** GSettings schema to **['none']**.

```
$ gsettings set org.gnome.desktop.remote-desktop.vnc encryption "['none']"
```

2. Optional: Red Hat recommends that you tunnel the VNC connection over SSH to your VNC port. As a result, the SSH tunnel keeps the connection encrypted.
   For example:

   a. On the client, configure the port forwarding.

```
# ssh -N -T -L 5901:server-ip-address:5901 user@server-ip-address
```

   b. Connect to the VNC session on the **localhost:5901** address.

CHAPTER 11. REMOTELY ACCESSING THE DESKTOP AS MULTIPLE USERS

You can remotely connect to the desktop on a RHEL server and open multiple sessions as different users at the same time.

Prerequisites

- Install the VNC server:

```
# dnf install tigervnc-server
```

- Install the VNC client:

```
# dnf install tigervnc
```

11.1. THE MAPPING OF PORT AND DISPLAY NUMBERS TO USERS IN VNC

With VNC, the client can connect to the desktop sessions of different users on the server. A display number and a TCP port number are attached to each server user that exports a VNC session. The client uses the port number to specify which server user it connects to.

If several clients connect using the same port number, they all open a VNC session to the same server user.

You must configure a mapping for each server user that exports a VNC session. For every such user, you must pick a unique port and display number.

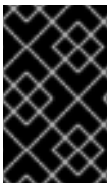
The recommended mapping

Red Hat recommends that you start with port number 5902 and display number 2 for the first user, and increment the numbers by one for each additional server user.

Port number 5900 and display number 0 represent the server user that is currently logged into the graphical session. You cannot start a VNC server for the user who is already logged into the graphical session.

Table 11.1. Port and display number pairs

Port number	Display number	Note
5900	0	The logged-in user
5901	1	
5902	2	The first recommended VNC user
5903	3	
...	...	



IMPORTANT

Red Hat recommends that you do not configure the **root** user to export a VNC session. A **root** VNC session is unsafe and certain elements of the session might not work as expected.

Firewall rules

You must open the selected ports in your firewall configuration. Allowing the **vnc-server** service in your firewall opens ports from 5900 to 5903. If you need to enable access to additional server users, you must open ports above 5903 by manually specifying the port numbers.

11.2. VNC SERVER CONFIGURATION FILES

Several configuration files affect the behavior of the VNC server. You can configure the user mapping and various global options.

General options

You can configure general options of the VNC server in the **/etc/tigervnc/vncserver-config-defaults** configuration file. The file uses the following format:

```
option1=value
option2
```

For example:

```
session=gnome
alwaysshared
securitytypes=vncauth,tlsvnc
desktop=sandbox
geometry=2000x1200
```

The priority of configuration files

The VNC server reads the following files for general options, in order from most important to least important:

1. **/etc/tigervnc/vncserver-config-mandatory**
   This file replaces the default configuration and has a higher priority than the per-user configuration. It is intended for system administrators who want to enforce particular VNC options.

2. **$HOME/.vnc/config**
   Individual users can override the default VNC configuration in this file.

3. **/etc/tigervnc/vncserver-config-defaults**
   This file stores the default VNC configuration.

User mapping

You can configure the mapping between users and their associated port and display numbers in the **/etc/tigervnc/vncserver.users** configuration file. The file uses the following format:

```
:number=user
```

For example:

```
:2=test
:3=vncuser
```

Additional resources

- For a list of available configuration options, see the **Xvnc(1)** man page.

11.3. ENABLING MULTI-USER VNC ACCESS ON THE SERVER

This procedure configures a RHEL server so that multiple users can open VNC sessions on it at the same time.

Prerequisites

- If you previously configured VNC using **systemd** unit files, remove any outdated VNC configuration:

```
[root]# rm /etc/systemd/system/vncserver@.service
```

Procedure

1. Map users to display and port numbers.
   In the **/etc/tigervnc/vncserver.users** configuration file, add a line for each server user that will export a VNC session:

   ```
   :user-number=user-name
   ```

   - Replace *user-number* with the port and display number mapped to the selected existing user.
   - Replace *user-name* with the user name of the selected existing user.

   For example:

   ```
   :2=vncuser
   ```

2. Open TCP ports 5900 to 5903 in the firewall:

   ```
   [root]# firewall-cmd --permanent --add-service=vnc-server
   ```

3. Reload the firewall rules:

   ```
   [root]# firewall-cmd --reload
   ```

4. Add the following lines to the **/etc/tigervnc/vncserver-config-defaults** configuration file:

   ```
   session=gnome
   alwaysshared
   ```

   This configuration has the following effects:

- The VNC server starts the GNOME session when a remote user logs in.
- Multiple users can connect to the VNC server at the same time.

5. As each server user that exports a VNC session, set the VNC password for the user:

```
[regular-user]$ vncpasswd
```

Remote clients must enter this password when connecting to the desktop on the server.

6. If you previously configured VNC for the user, ensure that the configuration files have the correct **SELinux** context:

```
[regular-user]$ restorecon -RFv ~/.vnc
```

7. Enable and start the VNC server unit for the regular user:

```
[root]# systemctl enable --now vncserver@:user-number
```

8. If the server uses the proprietary Nvidia driver, disable Wayland:
   a. Uncomment the **WaylandEnable=False** line in the **/etc/gdm/custom.conf** configuration file.
   b. Add the **DefaultSession=gnome-xorg.desktop** option to the **[daemon]** section of the configuration file.
   c. Reboot the server.

Additional resources

- To enable VNC access to more than two server users, open TCP ports above 5903. For details, see Opening a port using CLI or Opening ports using GUI.

11.4. CONNECTING TO THE VNC SERVER AS MULTIPLE USERS

This procedure connects to a remote desktop session using the **vncviewer** application. You can open multiple connections to the remote desktop at the same time.

Prerequisites

- Remote desktop access for multiple users is enabled on the server. For details, see Section 11.3, "Enabling multi-user VNC access on the server".

Procedure

- Connect to the VNC server:

```
$ vncviewer --shared server-ip:display
```

  - Replace *server-ip* with the IP address of the server that you are connecting to.
  - Replace *display* with the display number where the server user exports the VNC session.

CHAPTER 12. REMOTELY ACCESSING AN X11-BASED APPLICATION

You can remotely launch a graphical X11-based application on a RHEL server and use it from the remote client using X11 forwarding.

NOTE

This procedure works for legacy X11 applications, that is, applications that support the X11 display protocol.

12.1. ENABLING X11 FORWARDING ON THE SERVER

Configure a RHEL server so that remote clients can use graphical applications on the server over SSH.

Procedure

1. Install basic X11 packages:

```
# dnf install xorg-x11-xauth xorg-x11-fonts-\* xorg-x11-utils dbus-x11
```

NOTE

Your applications might rely on additional graphical libraries.

2. Enable the **X11Forwarding** option in the **/etc/ssh/sshd_config** configuration file:

```
X11Forwarding yes
```

The option is disabled by default in RHEL.

1. Restart the **sshd** service:

```
# systemctl restart sshd.service
```

12.2. LAUNCHING AN APPLICATION REMOTELY USING X11 FORWARDING

Access a graphical application on a RHEL server from a remote client using SSH.

Prerequisites

- X11 forwarding over SSH is enabled on the server. For details, see Section 12.1, “Enabling X11 forwarding on the server”.
- Ensure that an X11 display server is running on your system:
  - On RHEL, X11 is available by default in the graphical interface.
  - On Microsoft Windows, install an X11 server such as Xming.

- On macOS, install the XQuartz X11 server.

- You have configured and restarted an OpenSSH server. For details, see Configuring and starting an OpenSSH server.

Procedure

1. Log in to the server using SSH:

```
[local-user]$ ssh -X -Y remote-server
The authenticity of host 'remote-server (192.168.122.120)' can't be established.
ECDSA key fingerprint is SHA256:uYwFlgtP/2YABMHKv5BtN7nHK9SHRL4hdYxAPJVK/kY.
Are you sure you want to continue connecting (yes/no/[fingerprint])?
```

2. Confirm that a server key is valid by checking its fingerprint.

NOTE

If you plan to log in to the server on a regular basis, add the user's public key to the server using the **ssh-copy-id** command.

3. Continue connecting by typing **yes**.

```
Warning: Permanently added 'remote-server' (ECDSA) to the list of known hosts.
```

4. When prompted, type the server password.

```
local-user's password:
[local-user ~]$
```

5. Launch the application from the command line:

```
[remote-user]$ application-binary
```

TIP

To skip the intermediate terminal session, use the following command:

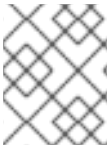
```
$ ssh user@server -X -Y -C binary_application
```

12.3. ADDITIONAL RESOURCES

- Remotely accessing an individual application on Wayland .
- Key differences between the Wayland and X11 protocol .

CHAPTER 13. REMOTELY ACCESSING A WAYLAND-BASED APPLICATION

You can remotely launch a graphical Wayland-based application on a RHEL server and use it from the remote client on Wayland using **waypipe**.



NOTE

The desktop applications shipped with RHEL 9 support both the Wayland and X11 display protocols. However, Wayland is the preferred option when both are available.

13.1. ENABLING WAYPIPE ON THE CLIENT AND SERVER

To be able to launch an individual application on Wayland, you need to install the **waypipe** package.

Prerequisite

- Both the client and server use the RHEL 9 operating system.

Procedure

1. Install the **waypipe** package on the local system.

```
# dnf install waypipe
```

2. Install the **waypipe** package on the remote system.

```
# dnf install waypipe
```

13.2. LAUNCHING AN APPLICATION REMOTELY USING WAYPIPE

You can accesses a graphical application on Wayland on a RHEL server from a remote client using SSH and **waypipe**.

NOTE

This procedure does not work for legacy X11 applications. For X11 applications, see Remotely accessing an individual application on X11 .

Prerequisites

- A Wayland display server is running on your system. On RHEL 9, GNOME as a Wayland compositor is the default.
- The **waypipe** package is installed on both the client and the remote system.
- The application is capable of running natively on Wayland.

Procedure

1. Launch the application remotely through **waypipe** and SSH.

```
[local-user]$ waypipe -c lz4=9 ssh remote-server application-binary

The authenticity of host 'remote-server (192.168.122.120)' can't be established.
ECDSA key fingerprint is SHA256:uYwFlgtP/2YABMHKv5BtN7nHK9SHRL4hdYxAPJVK/kY.
Are you sure you want to continue connecting (yes/no/[fingerprint])?
```

2. Confirm that a server key is valid by checking its fingerprint.
3. Continue connecting by typing **yes**.

```
Warning: Permanently added 'remote-server' (ECDSA) to the list of known hosts.
```

4. When prompted, type the server password.

```
remote-user's password:
[remote-user]$
```

13.3. ADDITIONAL RESOURCES

- Remotely accessing an individual application on X11 .
- Key differences between the Wayland and X11 protocol .

CHAPTER 14. BROWSING FILES ON A NETWORK SHARE

You can connect to a network share provided by a server and browse the files on the server like local files. You can download or upload files using the file browser.

14.1. GVFS URI FORMAT FOR NETWORK SHARES

GNOME uses the GVFS URI format to refer to network shares and files on them. When you connect to a network share from GNOME, you provide the address to the network share in the following format.

A URL, or uniform resource locator, is a form of address that refers to a location or file on a network. The address is formatted like this:

The basic GVFS URI format takes the following syntax:

> *protocol://server.example.com/folder/file*

The scheme specifies the protocol or type of server. The example.com portion of the address is called the domain name. If a username is required, it is inserted before the server name:

You can also specify the user name or the port number to the network share:

> *protocol://user@server.example.com:port/folder/file*

Table 14.1. Common network share protocols

Protocol	GVFS URI example
SSH	**ssh://user@server.example.com/path**
NFS	**nfs://server/path**
Windows SMB	**smb://server/Share**
WebDAV	**dav://example.server.com/path**
Public FTP	**ftp://ftp.example.com/path**
Authenticated FTP	**ftp://user@ftp.example.com/path**

Additional resources

- The GVFS system
- The format of the GVFS URI string

14.2. MOUNTING A STORAGE VOLUME IN GNOME

You can manually mount a local storage volume or a network share in the **Files** application.

Procedure

1. Open the **Files** application.
2. Click **Other Locations** in the side bar.
   The window lists all connected storage volumes and all network shares that are publicly available on your local area network.

   If you can see the volume or network share in this list, mount it by clicking the item.

   If you want to connect to a different network share, use the following steps.
3. Enter the GVFS URI string to the network share in the **Connect to Server** field.
4. Press **Connect**.
5. If the dialog asks you for login credentials, enter your name and password into the relevant fields.
6. When the mounting process finishes, you can browse the files on the volume or network share.

14.3. UNMOUNTING A STORAGE VOLUME IN GNOME

You can unmount a storage volume, a network share, or another resource in the **Files** application.

Procedure

1. Open the **Files** application.
2. In the side bar, click the **Unmount** (⏏) icon next to the chosen mount.
3. Wait until the mount disappears from the side bar or a notification about the safe removal appears.

14.4. ADDITIONAL RESOURCES (OR NEXT STEPS)

- Managing storage volumes in GNOME
- Mounting NFS shares
- Mounting an SMB Share on Red Hat Enterprise Linux

CHAPTER 15. STORING USER SETTINGS OVER NFS

If you use GNOME on a system with NFS home directories, you must set the **keyfile** back end for the **dconf** database. Otherwise, **dconf** might not work correctly. With this configuration, **dconf** stores settings in the ~/**.config**/**dconf-keyfile**/**user** file.

Procedure

1. Create or edit the /**etc**/**dconf**/**profile**/**user** file on every client.
2. At the very beginning of the /**etc**/**dconf**/**profile**/**user** file, add the following line:

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

3. Users must log out and log back in.
   dconf polls the **keyfile** back end to determine whether updates have been made, so settings might not be updated immediately.