

Getting Started with GNOME Desktop

Basic information and instructions

WHAT?

GNOME is a desktop environment with an easy-to-use graphical interface. Learn about the default configurations of GNOME Desktop, how to customize the settings to your needs, and how to perform regular tasks.

WHY?

SUSE Linux Enterprise Server comes along with GNOME Desktop. This article helps you to get familiar with its basic settings and how to use it for your daily tasks.

EFFORT

It takes approximately 35 minutes to read and understand this article.

GOAL

Get a basic understanding of what GNOME Desktop offers, and how to customize it to match your preferences.

Publication Date: 28 Aug 2025

Contents

- 1 Introduction to GNOME Desktop 3
- 2 Visual overview of GNOME Desktop 4

3	First steps to work with GNOME Desktop	6
4	Customizing the settings for GNOME Desktop	15
5	For more information	26
6	Legal Notice	26
A	GNU Free Documentation License	27

1 Introduction to GNOME Desktop

SUSE Linux Enterprise Server comes along with GNOME Desktop, a desktop environment with an easy-to-use graphical interface. This article describes the default configuration of GNOME Desktop. If you or your system administrator modify the defaults, certain aspects might be different, such as appearance or key combinations.

1.1 What is GNOME Desktop?

GNOME Desktop is a graphical environment for everything you see on the screen, like the login and home screen. It also offers several applications you need for your daily tasks like mail client, calendar, file browser, and many more.

Certain versions of SUSE Linux Enterprise Server ship with as many as four different session configurations based on GNOME. These are:

GNOME (default)

A GNOME 4 configuration that is close to the upstream design. It focuses on interrupting users as little as possible. However, starting applications and switching between them works differently from many other desktop operating systems. It uses a single panel at the top of the screen.

GNOME Classic and GNOME Classic on Xorg

GNOME classic is for users who prefer a more traditional desktop experience. It is based on GNOME 4 technologies but provides a number of changes to the user interface. GNOME Classic on Xorg starts on Xorg.

IceWM session

A basic desktop designed to use little resources. It can act as a fallback if other options are unavailable or slow.

The version described here is the default configuration of SUSE Linux Enterprise Server, which is GNOME. The main difference between the configurations is the look and feel of the home screen and the main menu. Most of what is described in the following applies to all four configurations.



Note: Wayland vs. Xorg

Both are full-featured, open source implementations of the X Window System, which provides the foundational graphical interface for Unix-like operating systems, including Linux. Xorg is a mature, highly compatible, but complex solution. Whereas Wayland is newer, using a simpler architecture, but it does not yet offer the wide range of compatibility and maturity as Xorg. Both protocols have their strengths and weaknesses. The choice between them depends on specific needs, including hardware compatibility, performance requirements, and the specific applications being used.

1.2 How does GNOME Desktop work?

In GNOME Desktop, you can find and open any application in the *Activities overview*. The settings of the desktop can be configured in the *Application* and *System* menu.

1.3 Benefits of GNOME Desktop

GNOME Desktop is a free, open source and easy-to-use desktop environment offering a variety of applications to help you organize and complete your daily tasks.

2 Visual overview of GNOME Desktop

Learn how to use the *Activities overview*, the *Clock* and *Calendar* features and the *Systems* menu.

2.1 *Activities overview*

The *Activities overview* shows a preview of all open windows and icons for favorite and running applications. It also integrates searching and browsing functionality.

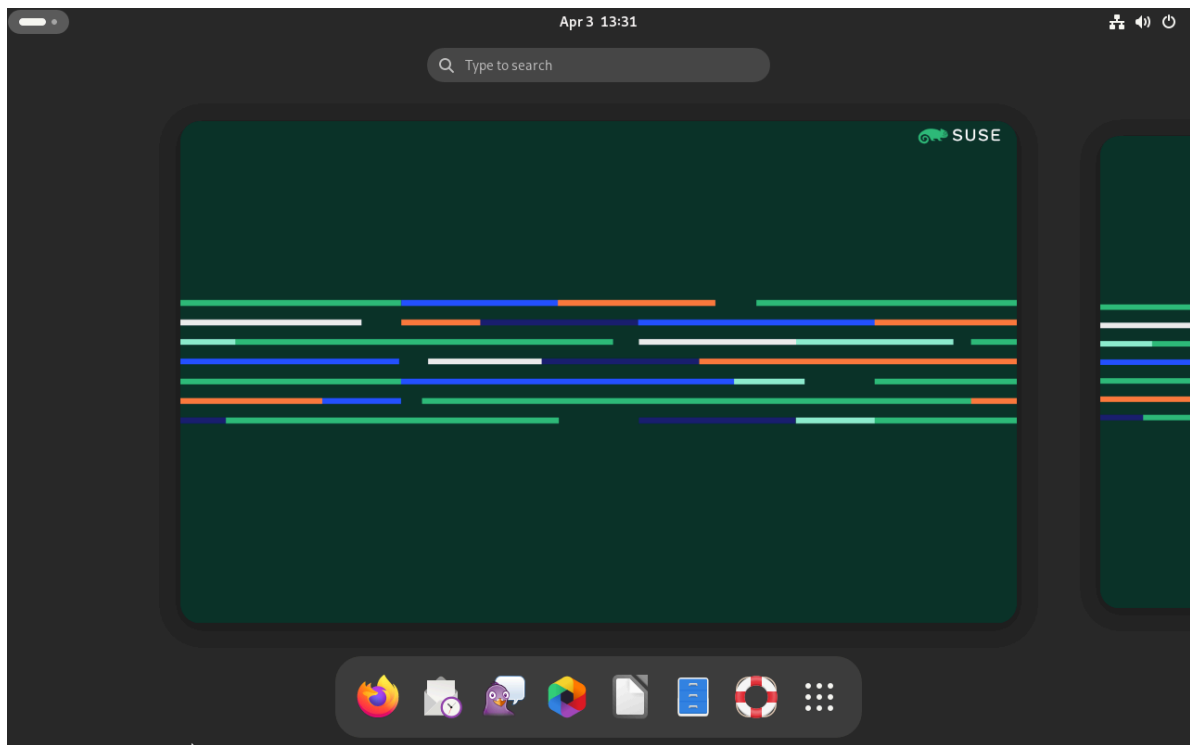


FIGURE 1: GNOME DESKTOP WITH ACTIVITIES OVERVIEW

OPENING THE *ACTIVITIES* OVERVIEW

To open the *Activities* overview, you have the following options:

- In the left corner of the top bar, click the *Activities* button.
- Move your mouse pointer to the upper-left hot corner.
- Press the **Meta** key on your keyboard.

FEATURES OF THE *ACTIVITIES* OVERVIEW

Search box

Use the search box at the top to find applications, settings and files in your home directory. To search, you do not need to click the search box. Begin typing directly after opening the *Activities* overview. Search starts while you type, you do not need to press **Enter**.

dash

The dash is the bar positioned in the center at the bottom. It contains your favorite applications and running applications. If you move the mouse pointer over one of the icons, the name of the corresponding application is displayed nearby. A small dot underneath the icon indicates that the application is running.

Right-clicking an icon opens a menu which offers different actions depending on the associated program. Using *Add to Favorites*, you can place the application icon permanently in dash. To remove a program icon from dash, select *Remove from Favorites*. To rearrange an icon, use the mouse to drag it to a new position.

2.2 *Clock and Calendar*

Click the clock icon on the top bar to see the current day of the week and time. If you are using the calendar function from Evolution, the *Calendar* itself or any other calendar application that is supported by *Calendar*, it also shows your upcoming appointments and notifications.

2.3 *System menu*

To customize your system settings, click the system menu in the top-right corner. Here you can quickly lock the screen, switch users or shut down your computer. For more information, refer to [Section 3.3, “Pausing or finishing your session”](#).

3 First steps to work with GNOME Desktop

Learn how to log in to GNOME Desktop, and how to pause or finish the session.

3.1 *Starting a session*

When starting your SUSE Linux Enterprise Server system, you first see a login screen, as all users must authenticate to start a session. The authentication step helps protect your personal information and data from unauthorized access.

PROCEDURE 1: HOW TO LOG IN

1. In the login screen, select your user name.
If your user name is not listed, click *Not listed?*. Then enter your user name and click *Next*.
2. Enter your password and confirm with **Enter** .

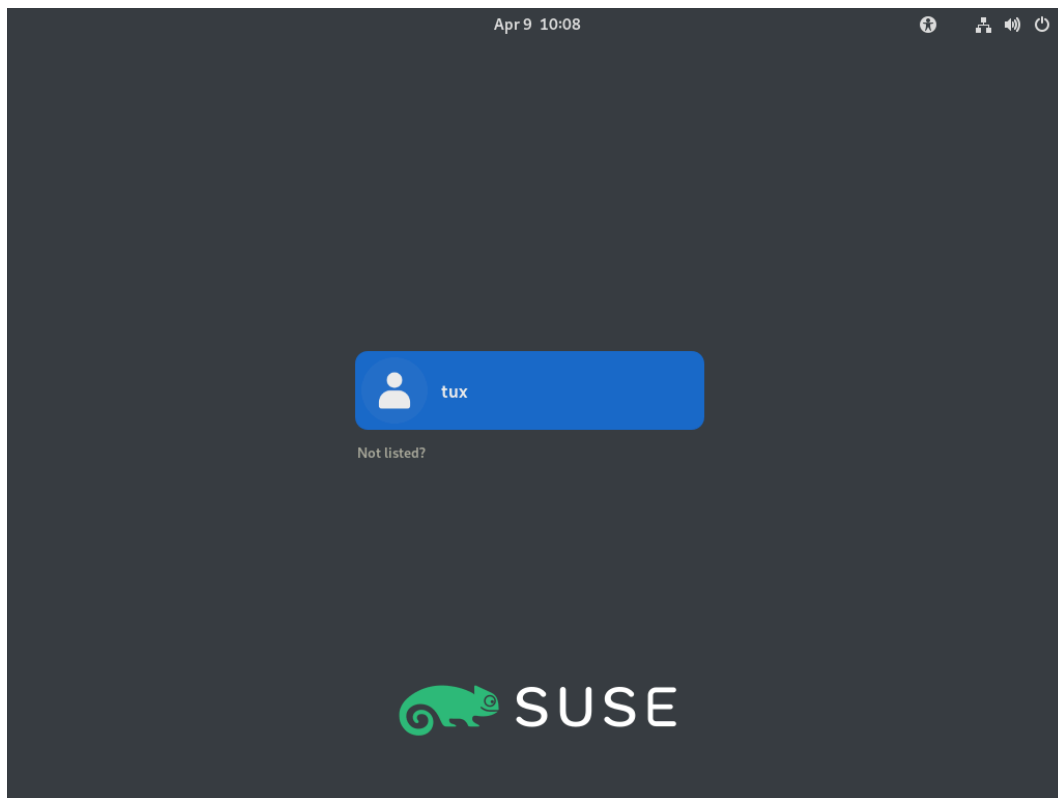


FIGURE 2: DEFAULT GNOME LOGIN SCREEN



Note: Enabling Auto Login

If a computer is used by a single person only, it is possible to enable Auto Login for this particular user at the system start. This saves time, but also impacts account security. Auto Login can be enabled or disabled during installation or at any time using the YaST User and Group Management module. For security reasons, Auto Login is not recommended.

3.2 Switching the session type

On SUSE Linux Enterprise Server, you can choose between the session types described above in [Section 1.1, “What is GNOME Desktop?”](#).

To try one of the additional GNOME session configurations or another desktop environment, follow the steps below.

PROCEDURE 2: SWITCHING THE SESSION TYPE

1. On the login screen, click your user name or enter it, as you normally would.

2. To change the session type, click the cog wheel icon in the lower right corner. A menu appears.

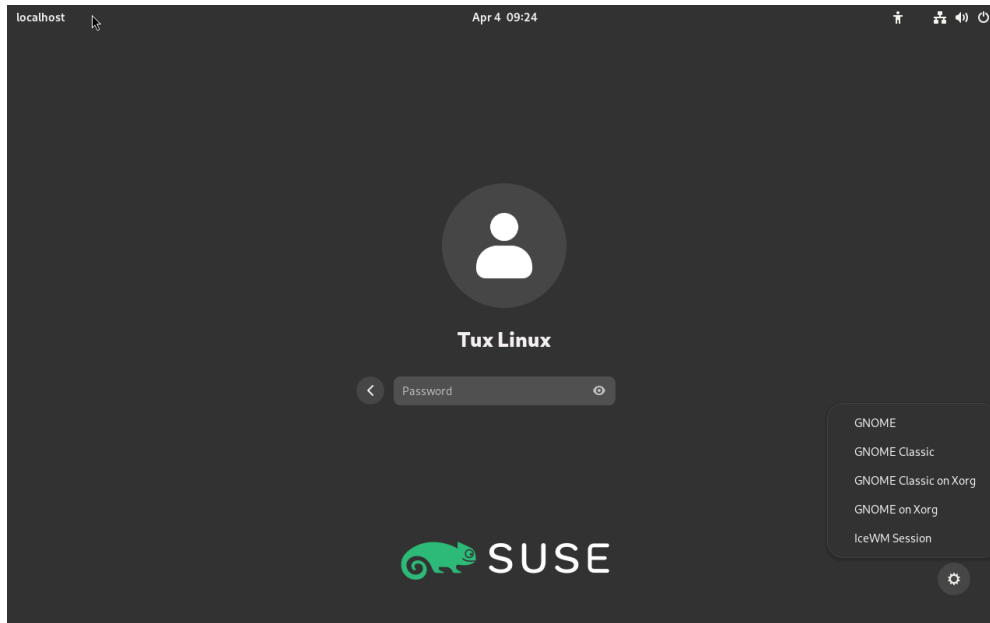


FIGURE 3: DEFAULT GNOME LOGIN SCREEN—SESSION TYPE

3. From the menu, select one of the entries. Depending on your configuration, there may be different choices.
4. Enter your password into the text box and confirm with **Enter**.

After switching to another session type once, the chosen session becomes your default session. To switch back, repeat the steps above.

3.3 Pausing or finishing your session

To pause or close your session, open the *System* menu in the upper-right corner of the top bar, click the *Power Off* button and choose one of the options listed.

- **Suspend.** Pause your session and put the computer into a state where it consumes a minimal amount of energy. Suspend mode can be configured to lock your screen, so nobody can look at or change your work. Waking up the computer is generally much quicker than a full computer start.

This mode is also known as suspend-to-RAM, sleep or standby mode.

- **Restart.** Finish the current session and restart the computer. Restarting is necessary to apply the system updates.
- **Power Off.** Finish the current session and turn off the computer.
- **Log Out or Switch User.** Finish the current session, but leave the computer on, so other users can log in. This option is only available if you have more than one user account on your system.

3.4 Locking the screen

1. To lock the screen, open the *System* menu in the upper-right corner of the top bar and click the padlock icon.

When you lock your screen, a curtain with a clock appears first. After a certain amount of time, the screen turns black.

2. To unlock the screen, move the mouse or press a key to display the locked screen dialog. Enter your password and press **Enter** to unlock the screen.

3.5 Logging out or switching users



Note: Option only available on multi-user system

The *Log Out* and *Switch User* entries only appear in the menu if you have more than one user account on your system.

1. Click the *System* menu in the upper-right corner of the top bar and click the *Power Off* button to open the menu.
2. Select one of the following options:

Log Out

Logs you out of the current session and returns you to the Login screen.

Switch User

Suspends your session, allowing another user to log in and use the computer.

3.6 Restarting or shutting down the computer

1. Click the *System* menu in the upper-right corner of the top bar and click the *Power Off* button to open the menu.
2. Select one of the following options:

Suspend

Pauses your session and puts the computer into a state where it consumes a minimal amount of energy. Suspend mode can be configured to lock your screen, so nobody can look at or change your work. Waking up the computer is generally much quicker than a full computer start.

Restart

Logs you out of the current session, then restarts the computer.

Power Off

Logs you out of the current session, then turns off the computer.

3.7 Managing files and directories

When starting your SUSE Linux Enterprise Server system, you first see a login screen, as all users must authenticate to start a session. The authentication step helps protect your personal information and data from unauthorized access.

PROCEDURE 3: HOW TO LOG IN

1. In the login screen, select your user name.
If your user name is not listed, click *Not listed?*. Then enter your user name and click *Next*.
2. Enter your password and confirm with **Enter**.

3.8 Accessing removable media

To access devices like USB flash drives or CDs and DVDs, insert or attach the medium. An icon for the medium is automatically created on the desktop. For many types of removable media, a GNOME Files window pops up automatically. If GNOME Files does not open, double-click the icon for that drive on the desktop to view the contents. In GNOME Files, an item for the medium in the sidebar appears.



Warning: Unmount to prevent data loss

Do not physically remove devices immediately after using them. Even when the system does not indicate that data is being written, the drive may not be finished with a previous operation.

To safely remove a device, proceed as follows:

1. From the *Activities* overview, open *Files*.
 2. Locate the device in the sidebar and click the *Eject* icon.
- Now you can safely remove the device.

3.9 Assistive technologies

The GNOME desktop includes assistive technologies to support users with helpful impairments and special needs, and to interact with common assistive devices. This chapter describes several assistive technology applications designed to meet the needs of users with physical disabilities like low vision or impaired motor skills.

3.9.1 Enabling assistive technologies

To configure accessibility features, open the *Settings* dialog by right-clicking the desktop and choosing *Settings*. In the navigation pane, select *Accessibility*. Each assistive feature can be enabled separately.

If you need a more direct access to individual assistive features, turn on *Always Show Universal Access Menu*. Now the top bar shows an icon which looks like a person surrounded by a circle.

3.9.2 Visual assistance

In the *Seeing* section of the *Accessibility* dialog, you can enable features that help people with impaired vision.

- Turning on *High Contrast* enables high-contrast black and white icons in the GNOME desktop.
- Turning on *Large Text* enlarges the font used in the user interface.

- Turning on *Zoom* enables a screen magnifier. You can set the magnification and magnifier behavior, including color effects.
- By customizing the *Cursor Size*, you can increase the visibility of the mouse pointer.
- If the *Screen Reader* is turned on, any UI element or text that receives keyboard focus is read aloud.
- If the *Sound Keys* are turned on, a sound is played whenever **Num Lock** or **Caps Lock** is turned on.

3.9.3 Hearing assistance

In the *Hearing* section of the *Accessibility* dialog, you can enable features helping people with impaired hearing.

If the *Visual Alerts* are turned on, a window title or the entire screen is flashed when an alert sound occurs for the respective application.

3.9.4 Keyboard and mouse

In the *Typing* and *Pointing and Clicking* sections of the *Accessibility* dialog, you can enable features that help people with mobility impairments.

- If the *Screen Keyboard* is turned on, an on-screen keyboard appears at the bottom of the screen when you next have the opportunity to type.

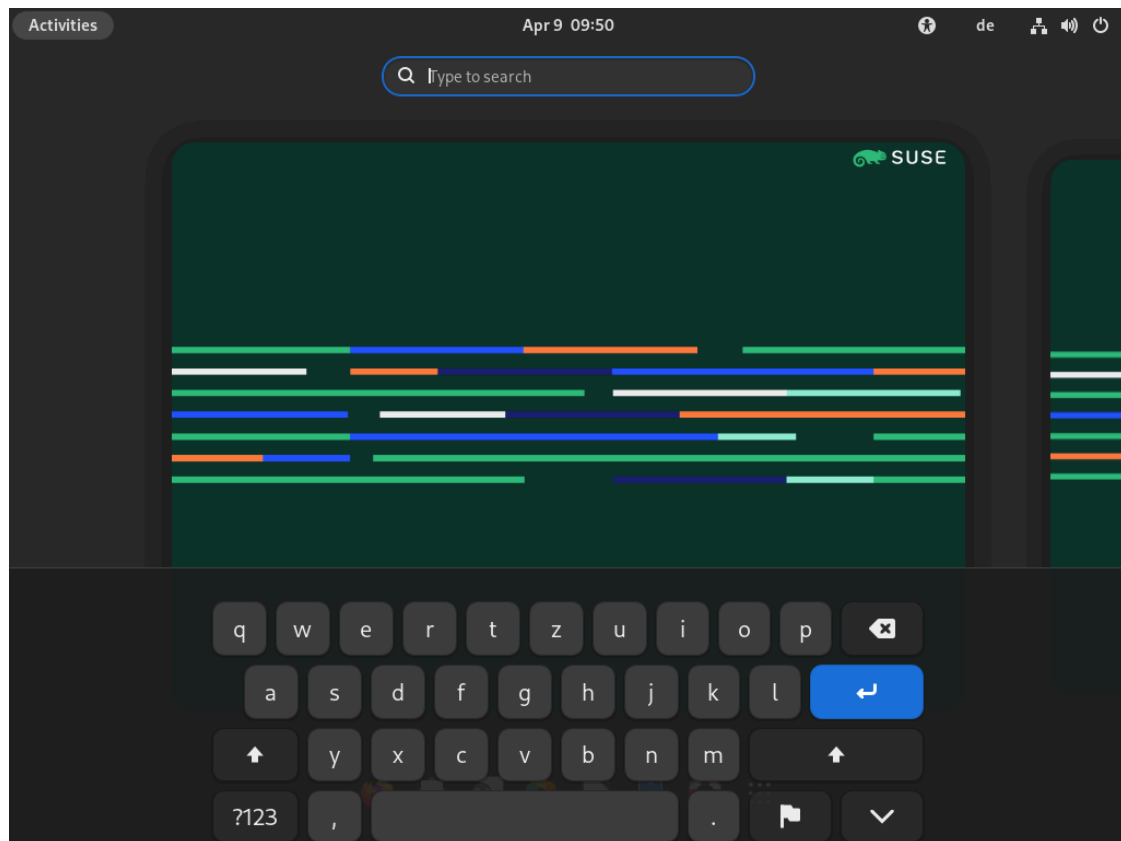


FIGURE 4: ON-SCREEN KEYBOARD

To enter numbers and symbols, press the **?123** button first. More symbols are available if you press the **=/ <** button. To return to the alphabetic keyboard, press the **ABC** button. To temporarily hide the keyboard, press the button with the arrow down icon. The keyboard is shown again automatically in the next situation where you can use it. To change your keyboard layout or change *Region & Language* settings, press the button with the flag icon.

- *Repeat Keys* lets you configure if a key is repeated when it is pressed for a longer time. You can either turn this feature *Off* or configure a *Delay* and the *Speed* by which keys are repeated.
- Under *Cursor Blinking* you can configure if and at which speed the cursor blinks in text boxes (for example, in a terminal).

- Click *Typing Assist (AccessX)* to open a dialog where you can enable more features that make typing easier:
 - With *Enable by Keyboard*, you can turn accessibility features on or off by using the keyboard.
 - *Sticky Keys* allows you to type key combinations one key at a time rather than having to hold down all keys at once. For example, the **Alt** + **→** shortcut switches between windows.
With sticky keys turned off, you need to hold down both keys at the same time. With sticky keys turned on, press **Alt** and then **→** to do the same.
 - Turn on *Slow Keys* if you want a delay between pressing a key and the letter being displayed on the screen. This means that you need to hold down each key you want to type for a little while before it appears. Use slow keys if you accidentally press several keys at a time when you type, or if you find it difficult to press the right key on the keyboard first time.
 - Turn on *Bounce Keys* to ignore key presses that are rapidly repeated. This can help, for example, if you have hand tremors which cause you to press a key multiple times when you only want to press it once.
- Turn on *Mouse Keys* to control the mouse pointer using the numeric keypad on your keyboard.
- Click *Click Assist* to open a dialog where you can enable more features that make clicking easier: simulated secondary click and hover click.
 - Turn on *Simulated Secondary Click* to activate the secondary click (usually the right mouse button) by holding down the primary button for a predefined *Acceptance delay*. This is useful if you find it difficult to move your fingers individually on one hand, or if your pointing device only has a single button.
 - Turn on *Hover Click* to trigger a click by hovering your mouse pointer over an object on the screen. This is useful if you find it difficult to move the mouse and click at the same time. If this feature is turned on, a small hover click window opens and stays above all your other windows. Use this to choose what type of click should

happen when you hover. When you hover your mouse pointer over a button and do not move it, the pointer gradually changes color. When it has fully changed color, the button is clicked.

- Use the slider to adjust the *Double-Click Delay* according to your needs.

4 Customizing the settings for GNOME Desktop

Learn how to customize the settings for GNOME Desktop, like changing the background or configuring language and keyboard settings to suit your personal taste and needs.

4.1 Configuring the desktop background

The desktop background is the image or color that is applied to your desktop. You can also customize the image shown when the screen is locked.

To change the desktop background:

1. Right-click the desktop and choose *Change Background*.

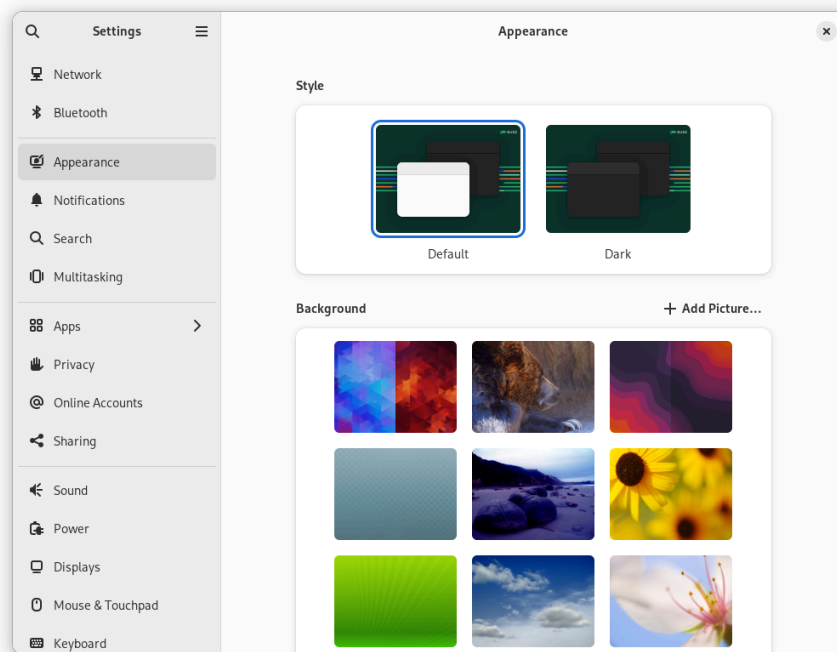


FIGURE 5: GNOME BACKGROUND SETTINGS

2. Select one of the wallpapers (preconfigured images distributed with your system) shown in the content area.
3. Alternatively, click *Add Picture* to select an image from your Pictures directory (~/Pictures) or another location in your file system.
4. Close the *Settings* dialog.

The new background is now shown on your desktop.

4.2 Configuring language settings

SUSE Linux Enterprise Server can be configured to use any of several languages. The language setting determines the language of dialogs and menus and can also determine the keyboard and clock layout.

To configure your language settings, right-click the desktop and choose *Settings*. Now choose *Region & Language*.

Here you can choose:

- *Language*. Choose a language from the list. For the change to take effect, you are prompted to *Restart* the desktop session. To do so, you must log out of your session and log back in afterward.
- *Formats*. To change the formats for date, number, currency and related options, choose a country from the list. For the change to take effect, you must log out of your session and log back in afterward.



Note: Settings made using **ibus-setup** do not take effect


On GNOME, settings made using **ibus-setup** do not take effect. **ibus-setup** can only be used to configure IceWM. Instead, always use the *Settings* application:

- To change input methods, select *Keyboard* in the navigation pane of the *Settings* dialog.
- To change the key combination that switches between input methods, use *Keyboard > Keyboard Shortcuts*. Then select the category *Typing* and the entry *Switch to next input source*.

4.3 Configuring the keyboard

Refer to [Section 3.9, “Assistive technologies”](#) for additional settings, such as key auto-repetition and cursor blink rate, and accessibility features. To configure your keyboard layout, refer to [Section 3.9.4, “Keyboard and mouse”](#).

To modify keyboard shortcuts, right-click the desktop and choose *Settings*. Now select *Keyboard > Keyboard Shortcuts*.

This dialog shows the keyboard shortcuts that are configured for your system. To edit a key combination, click the entry that you want to change. To set a new key combination, press the respective keys. To disable a shortcut, press  instead.

4.4 Using XCompose to type special characters

GNOME supports fast input source (keyboard layout) switching ([Section 4.2, “Configuring language settings”](#)). However, if you are using **xmodmap** to create custom keymaps, it may not work correctly when you switch between multiple input sources. For example, you have two input sources, English and German. Your **xmodmap** commands work fine in the first input source you select, but when you switch to the second input source, the same **xmodmap** commands produce incorrect output. **xmodmap** is an older protocol and does not have a full view of the keyboard layout, so in more complex situations it causes errors.

An alternative method is to use **xcompose** to assign special symbols to sequences of key presses. This should work with any input source. Install **xcompose** by installing the `libX11-devel` package.

Next, assign a compose key with the *Tweaks* tool in the *Activities* overview. Press this key in sequence with one or two additional keys to print a special character. The keys must be pressed in the correct sequence, starting with the compose key.

In the *Tweaks* tool, navigate to *Keyboard & Mouse* > *Compose Key* and select your command key ([Figure 6, “Enabling the compose key in tweaks”](#)).

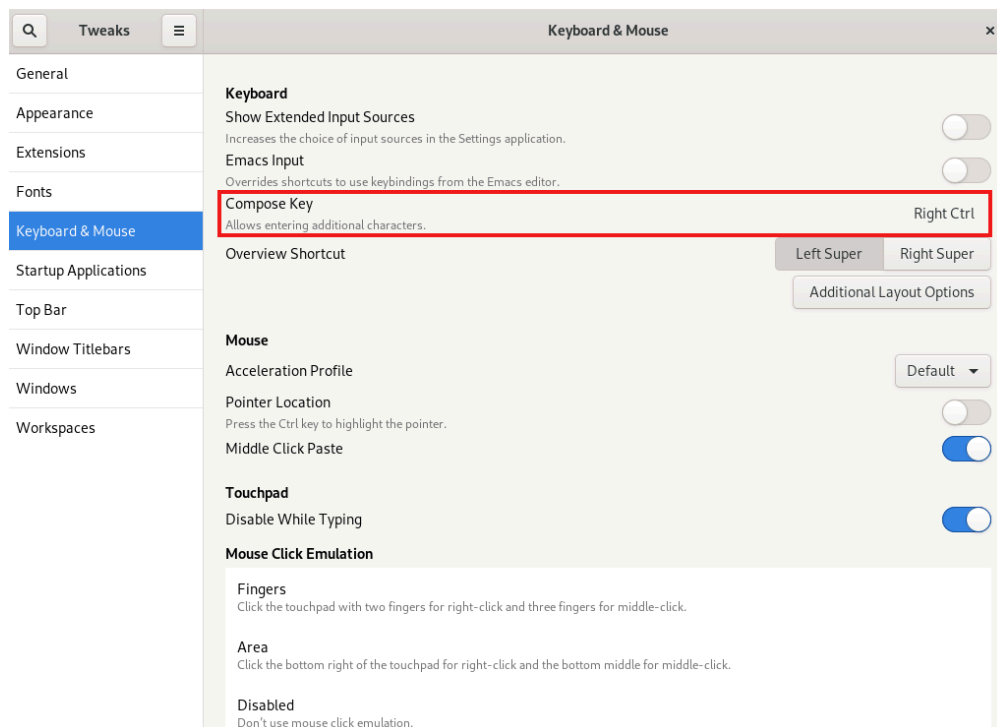


FIGURE 6: ENABLING THE COMPOSE KEY IN TWEAKS

Next, create a `~/.XCompose` file. This is the default per-user configuration file. Enter your key mappings in this file, as in this example:

```
include "%L"

<Multi_key> <a> : "α"
<Multi_key> <b> : "β"
<Multi_key> <exclam> : "¡"
```

`include "%L"` includes the default compose file for your locale, for example `/usr/share/X11/locale/en_US.UTF-8`.

The remaining lines specify the compose key, the other key presses, and the symbols they are intended to print. After you make changes to your compose file, you must log out of your session and log back in to activate the changes.

Your key assignments are case-sensitive. `~/.XCompose` overrides the system files. Use the compose file for your locale to see what is already configured, and to copy symbols from it into your personal compose file. (These files may have a lot of whitespace at the beginning but they are not empty, so keep scrolling.) As always, watch out for conflicts with the other keymaps on your system.

For additional information, see `man xcompose`.

4.5 Configuring Bluetooth settings

The Bluetooth module lets you set the visibility of your machine over Bluetooth and connect to available Bluetooth devices. To configure Bluetooth connectivity, follow these steps:

1. Right-click the desktop and choose *Settings*. Now choose *Bluetooth*.
2. To use Bluetooth, set the switch at the top on.
Your computer is visible as long as the Bluetooth panel is open.



Note: Temporary visibility

The *Visibility* switch is meant to be used only temporarily. You only need to turn it on for the initial setup of a connection to a Bluetooth device. After the connection has been established, turn off the switch.

3. On the device you want to connect, turn on Bluetooth connectivity and visibility, too.

4. If the device has been found and is shown in the list, click it to establish a connection to it. You are asked whether the PINs of the two devices match.
5. If the PINs match, confirm this on *both* your computer and the device. The pairing is now established. On your computer, the device in the list is shown as *Connected*. Depending on the device type, it is also now available in other applications, for example, as a storage device in GNOME Files, or a sound device in playback applications.

To connect to a paired Bluetooth device, select the device in the list. In the dialog that appears, turn the *Connection* switch on. You can send files to the connected device by using the *Send Files* button. If you are connected to a device such as a mobile phone, you can use it as a network device by activating the appropriate option.

To remove a connected device from the list on your computer, click *Remove Device* and confirm your choice. To remove the pairing, you also need to do so on your device.

4.6 Configuring power settings

Settings available in this dialog depend on your hardware. In the following, the options that are typically available when using a laptop are described. On a workstation, many of the described options are not available.

1. Right-click the desktop and choose *Settings*.
2. In the navigation pane, select *Power*.
3. In the *Power Saving Options* of the content area, set after how many minutes to blank the screen (or to not blank it at all).
4. In the *Automatic Suspend* section of the dialog, configure a time after which the computer is paused after a certain period of inactivity.

4.7 Configuring mouse and touchpad

To modify mouse and touchpad options, right-click the desktop and choose *Settings*. Then select *Mouse & Touchpad*.

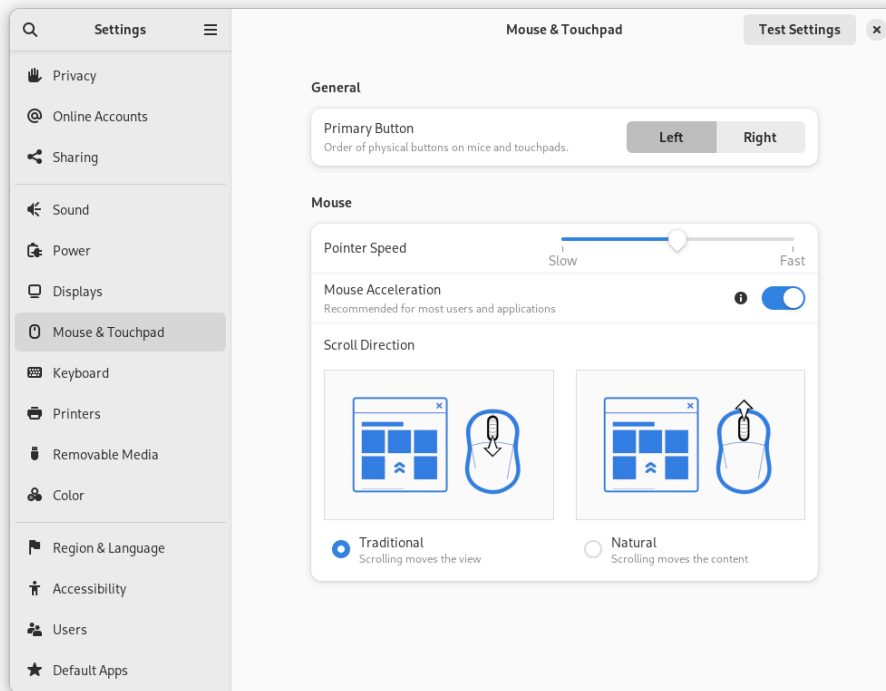


FIGURE 7: *MOUSE AND TOUCHPAD SETTINGS DIALOG*

- In the *General* section of the dialog, you can set the *Primary button* orientation (left or right).
- In the *Mouse* section of the dialog, use *Mouse Speed* to adjust the sensitivity of the mouse pointer.

With *Natural Scrolling*, you can set the direction in which the content moves when scrolling with the mouse. When natural scrolling is turned off, the content moves *up* while pushing the scroll wheel *down*. When natural scrolling is turned on, the content moves in the same direction as the mouse wheel.

- To test your settings, click *Test Your Settings* and try the pointing device.

For configuration of mouse accessibility options, refer to the [Section 3.9.4, “Keyboard and mouse”](#).

4.8 Installing and configuring printers

The *Printers* dialog lets you connect to any available local or remote CUPS server and configure printers.

To start the Printers module, right-click the desktop and choose *Settings*. Now choose *Printers*. For detailed information, refer to <https://help.gnome.org/users/gnome-help/stable/printing.html.en>.

4.9 Configuring screens

To specify resolution and orientation for your screen or to configure multiple screens, right-click the desktop and choose *Display Settings*. The configuration options available in this dialog depend on whether you have a single or a multiple monitor setup.

4.9.1 Configuring single monitor setup

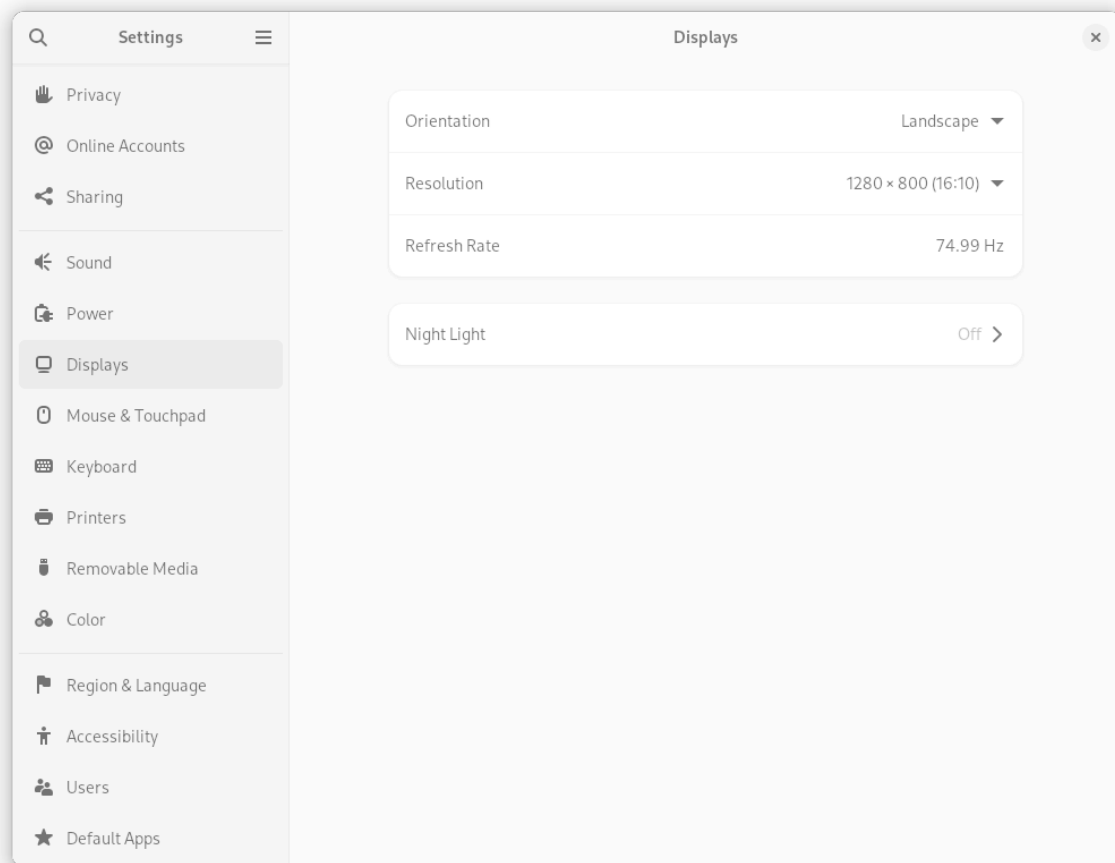


FIGURE 8: SINGLE MONITOR SETTINGS DIALOG

Orientation

If you use a monitor which can change its orientation, you need to adjust the display before turning the monitor. Use *Orientation* to do this. Choose the orientation your monitor supports, close the selection box and click *Apply*.

Resolution

To change the screen resolution, click *Resolution*. Choose a new value and click *Apply*.

Night Light

If you are working in a dark environment, your eyes can easily be strained by the monitor. To prevent this, change the screen's color palette to a warmer tone by turning on *Night Light*. Under *Schedule*, you can automate this setting by specifying at which time *Night Light* should be turned on and off.

4.9.2 Configuring multiple monitor setup

To set up an additional monitor, connect the monitor to your computer. If your system does not recognize it immediately, or you want to adjust the settings, do the following:

1. Open the *Activities* overview and start typing Displays.
2. Click *Displays* to open the panel.
3. In the display arrangement diagram, drag your displays to the relative positions you want.
4. Click *Primary Display* to choose your primary display.
The primary display is the one with the *top bar*, and where the *Activities* overview is shown.
5. Select the orientation, resolution or scale, and refresh rate.
6. Click *Apply*. The new settings are applied for 20 seconds before reverting. If you are happy with the settings, click *Keep Changes*.

With two or more screens, these display modes are available:

Join Display

The screen edges are joined so windows and dialogs can pass from one display to another.

Mirror

The same content is shown on all displays, with the same resolution and orientation for all.

Single display

Only one display is configured, effectively turning off the other displays. For example, an external monitor connected to a docked laptop with the lid closed.

4.10 Configuring sound settings

The *Sound* tool lets you manage sound devices. Here you can select the general output volume or turn the sound off.

To open the sound settings, right-click the desktop and choose *Settings*. Now choose *Sound*.

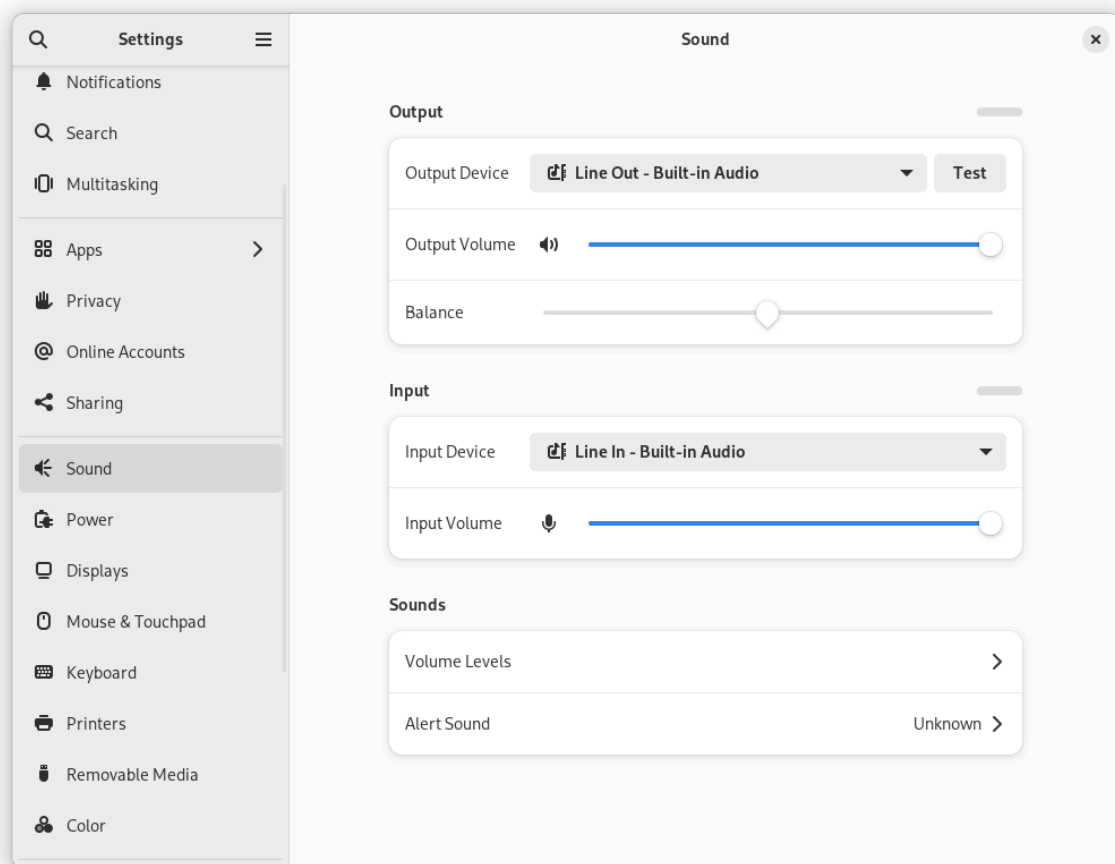


FIGURE 9: CONFIGURING SOUND SETTINGS

Use the *Output* category to select the device for sound output. Choose the *Balance* setting you prefer.

Use the *Input* category to set the input device volume or to mute the input temporarily. If you have more than one sound device, you can also select a default device for audio input in the *Input Device* list.

You can also choose an *Alert Sound*.

4.11 Configuring default applications

1. To change the default application for common tasks such as browsing the Internet, sending e-mails or playing multimedia files, right-click the desktop and select *Settings*. Now choose *Default Applications*.

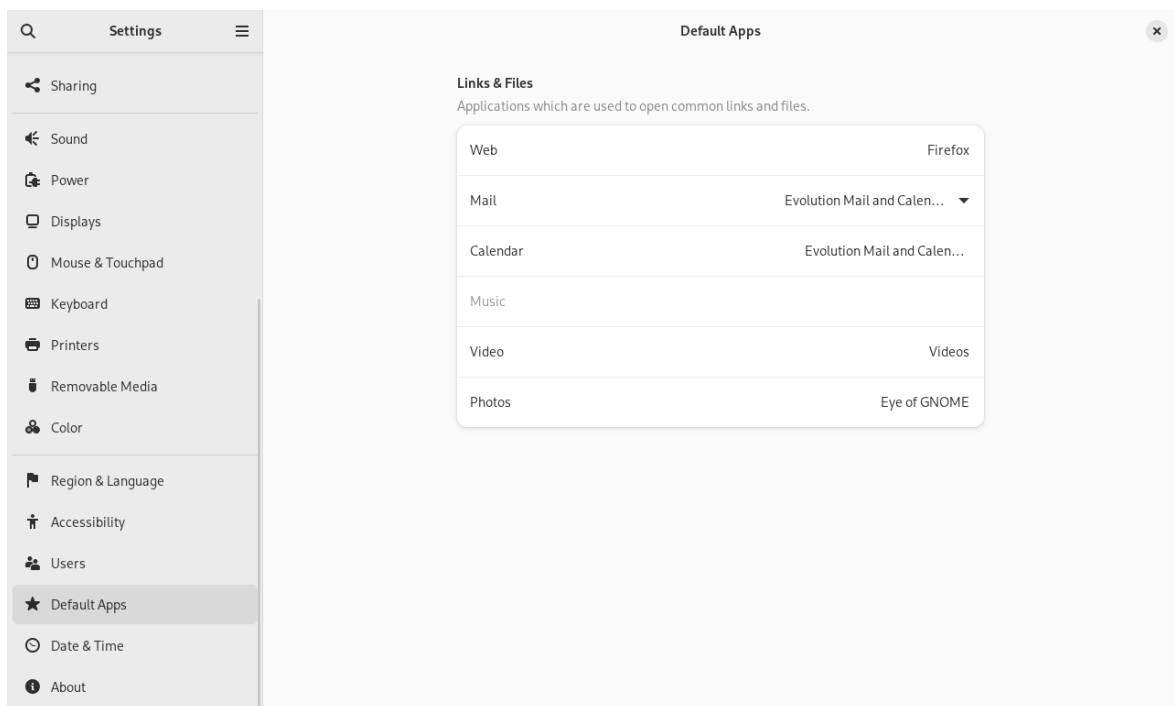


FIGURE 10: DEFAULT APPLICATIONS

2. You can choose an application to handle Web, mail, calendar, music, videos or photographs. Select one of the available applications from the drop-down boxes for the task of your choice.

4.12 Configuring session sharing preferences

To open a configuration dialog for allowing remote logins via SSH, right-click the desktop and choose *Settings*. Then choose *Sharing*.

Before you can share anything, you need to turn on the switch in the upper part of the dialog. The switch also helps you if you quickly need to disable all sharing options.

To enable logging in via SSH, click *Remote Login* and enter the administrator password.

5 For more information

SUSE Linux Enterprise Server comes with several sources of information and documentation, many of which are already integrated into your installed system.

To enter the Help of GNOME or LibreOffice directly from an application, click the *Help* button or press **F1** key. Both options take you directly to the application's documentation in the help center.

You can also start the Help of GNOME by opening a terminal and entering **yelp** or from the main menu by clicking *Applications > Favorites > Help*.

WEB LINKS

- For more information on how to work with GNOME Desktop, see <https://help.gnome.org>.
- For more information on how to work with LibreOffice, see <https://help.libreoffice.org>.

6 Legal Notice

Copyright© 2006–2025 SUSE LLC and contributors. All rights reserved.

Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.2 or (at your option) version 1.3; with the Invariant Section being this copyright notice and license. A copy of the license version 1.2 is included in the section entitled “GNU Free Documentation License”.

For SUSE trademarks, see <https://www.suse.com/company/legal/>. All other third-party trademarks are the property of their respective owners. Trademark symbols (®, ™ etc.) denote trademarks of SUSE and its affiliates. Asterisks (*) denote third-party trademarks.

All information found in this book has been compiled with utmost attention to detail. However, this does not guarantee complete accuracy. Neither SUSE LLC, its affiliates, the authors, nor the translators shall be held liable for possible errors or the consequences thereof.

A GNU Free Documentation License

Copyright (C) 2000, 2001, 2002 Free Software Foundation, Inc. 51 Franklin St, Fifth Floor, Boston, MA 02110-1301 USA. Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

0. PREAMBLE

The purpose of this License is to make a manual, textbook, or other functional and useful document "free" in the sense of freedom: to assure everyone the effective freedom to copy and redistribute it, with or without modifying it, either commercially or non-commercially. Secondly, this License preserves for the author and publisher a way to get credit for their work, while not being considered responsible for modifications made by others.

This License is a kind of "copyleft", which means that derivative works of the document must themselves be free in the same sense. It complements the GNU General Public License, which is a copyleft license designed for free software.

We have designed this License to use it for manuals for free software, because free software needs free documentation: a free program should come with manuals providing the same freedoms that the software does. But this License is not limited to software manuals; it can be used for any textual work, regardless of subject matter or whether it is published as a printed book. We recommend this License principally for works whose purpose is instruction or reference.

1. APPLICABILITY AND DEFINITIONS

This License applies to any manual or other work, in any medium, that contains a notice placed by the copyright holder saying it can be distributed under the terms of this License. Such a notice grants a world-wide, royalty-free license, unlimited in duration, to use that work under the conditions stated herein. The "Document", below, refers to any such manual or work. Any member of the public is a licensee, and is addressed as "you". You accept the license if you copy, modify or distribute the work in a way requiring permission under copyright law.

A "Modified Version" of the Document means any work containing the Document or a portion of it, either copied verbatim, or with modifications and/or translated into another language.

A "Secondary Section" is a named appendix or a front-matter section of the Document that deals exclusively with the relationship of the publishers or authors of the Document to the Document's overall subject (or to related matters) and contains nothing that could fall directly within that overall subject. (Thus, if the Document is in part a textbook of mathematics, a Secondary Section may not explain any mathematics.) The relationship could be a matter of historical connection with the subject or with related matters, or of legal, commercial, philosophical, ethical or political position regarding them.

The "Invariant Sections" are certain Secondary Sections whose titles are designated, as being those of Invariant Sections, in the notice that says that the Document is released under this License. If a section does not fit the above definition of Secondary then it is not allowed to be designated as Invariant. The Document may contain zero Invariant Sections. If the Document does not identify any Invariant Sections then there are none.

The "Cover Texts" are certain short passages of text that are listed, as Front-Cover Texts or Back-Cover Texts, in the notice that says that the Document is released under this License. A Front-Cover Text may be at most 5 words, and a Back-Cover Text may be at most 25 words.

A "Transparent" copy of the Document means a machine-readable copy, represented in a format whose specification is available to the general public, that is suitable for revising the document straightforwardly with generic text editors or (for images composed of pixels) generic paint programs or (for drawings) some widely available drawing editor, and that is suitable for input to text formatters or for automatic translation to a variety of formats suitable for input to text formatters. A copy made in an otherwise Transparent file format whose markup, or absence of markup, has been arranged to thwart or discourage subsequent modification by readers is not Transparent. An image format is not Transparent if used for any substantial amount of text. A copy that is not "Transparent" is called "Opaque".

Examples of suitable formats for Transparent copies include plain ASCII without markup, Texinfo input format, LaTeX input format, SGML or XML using a publicly available DTD, and standard-conforming simple HTML, PostScript or PDF designed for human modification. Examples of transparent image formats include PNG, XCF and JPG. Opaque formats include proprietary formats that can be read and edited only by proprietary word processors, SGML or XML for which the DTD and/or processing tools are not generally available, and the machine-generated HTML, PostScript or PDF produced by some word processors for output purposes only.

The "Title Page" means, for a printed book, the title page itself, plus such following pages as are needed to hold, legibly, the material this License requires to appear in the title page. For works in formats which do not have any title page as such, "Title Page" means the text near the most prominent appearance of the work's title, preceding the beginning of the body of the text.

A section "Entitled XYZ" means a named subunit of the Document whose title either is precisely XYZ or contains XYZ in parentheses following text that translates XYZ in another language. (Here XYZ stands for a specific section name mentioned below, such as "Acknowledgements", "Dedications", "Endorsements", or "History".) To "Preserve the Title" of such a section when you modify the Document means that it remains a section "Entitled XYZ" according to this definition.

The Document may include Warranty Disclaimers next to the notice which states that this License applies to the Document. These Warranty Disclaimers are considered to be included by reference in this License, but only as regards disclaiming warranties: any other implication that these Warranty Disclaimers may have is void and has no effect on the meaning of this License.

2. VERBATIM COPYING

You may copy and distribute the Document in any medium, either commercially or non-commercially, provided that this License, the copyright notices, and the license notice saying this License applies to the Document are reproduced in all copies, and that you add no other conditions whatsoever to those of this License. You may not use technical measures to obstruct or control the reading or further copying of the copies you make or distribute. However, you may accept compensation in exchange for copies. If you distribute a large enough number of copies you must also follow the conditions in section 3.

You may also lend copies, under the same conditions stated above, and you may publicly display copies.

3. COPYING IN QUANTITY

If you publish printed copies (or copies in media that commonly have printed covers) of the Document, numbering more than 100, and the Document's license notice requires Cover Texts, you must enclose the copies in covers that carry, clearly and legibly, all these Cover Texts: Front-Cover Texts on the front cover, and Back-Cover Texts on the back cover. Both covers must also clearly and legibly identify you as the publisher of these copies. The front cover must present the full title with all words of the title equally prominent and visible. You may add other material

on the covers in addition. Copying with changes limited to the covers, as long as they preserve the title of the Document and satisfy these conditions, can be treated as verbatim copying in other respects.

If the required texts for either cover are too voluminous to fit legibly, you should put the first ones listed (as many as fit reasonably) on the actual cover, and continue the rest onto adjacent pages.

If you publish or distribute Opaque copies of the Document numbering more than 100, you must either include a machine-readable Transparent copy along with each Opaque copy, or state in or with each Opaque copy a computer-network location from which the general network-using public has access to download using public-standard network protocols a complete Transparent copy of the Document, free of added material. If you use the latter option, you must take reasonably prudent steps, when you begin distribution of Opaque copies in quantity, to ensure that this Transparent copy will remain thus accessible at the stated location until at least one year after the last time you distribute an Opaque copy (directly or through your agents or retailers) of that edition to the public.

It is requested, but not required, that you contact the authors of the Document well before redistributing any large number of copies, to give them a chance to provide you with an updated version of the Document.

4. MODIFICATIONS

You may copy and distribute a Modified Version of the Document under the conditions of sections 2 and 3 above, provided that you release the Modified Version under precisely this License, with the Modified Version filling the role of the Document, thus licensing distribution and modification of the Modified Version to whoever possesses a copy of it. In addition, you must do these things in the Modified Version:

- A. Use in the Title Page (and on the covers, if any) a title distinct from that of the Document, and from those of previous versions (which should, if there were any, be listed in the History section of the Document). You may use the same title as a previous version if the original publisher of that version gives permission.
- B. List on the Title Page, as authors, one or more persons or entities responsible for authorship of the modifications in the Modified Version, together with at least five of the principal authors of the Document (all of its principal authors, if it has fewer than five), unless they release you from this requirement.

- C. State on the Title page the name of the publisher of the Modified Version, as the publisher.
- D. Preserve all the copyright notices of the Document.
- E. Add an appropriate copyright notice for your modifications adjacent to the other copyright notices.
- F. Include, immediately after the copyright notices, a license notice giving the public permission to use the Modified Version under the terms of this License, in the form shown in the Addendum below.
- G. Preserve in that license notice the full lists of Invariant Sections and required Cover Texts given in the Document's license notice.
- H. Include an unaltered copy of this License.
- I. Preserve the section Entitled "History", Preserve its Title, and add to it an item stating at least the title, year, new authors, and publisher of the Modified Version as given on the Title Page. If there is no section Entitled "History" in the Document, create one stating the title, year, authors, and publisher of the Document as given on its Title Page, then add an item describing the Modified Version as stated in the previous sentence.
- J. Preserve the network location, if any, given in the Document for public access to a Transparent copy of the Document, and likewise the network locations given in the Document for previous versions it was based on. These may be placed in the "History" section. You may omit a network location for a work that was published at least four years before the Document itself, or if the original publisher of the version it refers to gives permission.
- K. For any section Entitled "Acknowledgements" or "Dedications", Preserve the Title of the section, and preserve in the section all the substance and tone of each of the contributor acknowledgements and/or dedications given therein.
- L. Preserve all the Invariant Sections of the Document, unaltered in their text and in their titles. Section numbers or the equivalent are not considered part of the section titles.
- M. Delete any section Entitled "Endorsements". Such a section may not be included in the Modified Version.
- N. Do not retitle any existing section to be Entitled "Endorsements" or to conflict in title with any Invariant Section.
- O. Preserve any Warranty Disclaimers.

If the Modified Version includes new front-matter sections or appendices that qualify as Secondary Sections and contain no material copied from the Document, you may at your option designate some or all of these sections as invariant. To do this, add their titles to the list of Invariant Sections in the Modified Version's license notice. These titles must be distinct from any other section titles.

You may add a section Entitled "Endorsements", provided it contains nothing but endorsements of your Modified Version by various parties--for example, statements of peer review or that the text has been approved by an organization as the authoritative definition of a standard.

You may add a passage of up to five words as a Front-Cover Text, and a passage of up to 25 words as a Back-Cover Text, to the end of the list of Cover Texts in the Modified Version. Only one passage of Front-Cover Text and one of Back-Cover Text may be added by (or through arrangements made by) any one entity. If the Document already includes a cover text for the same cover, previously added by you or by arrangement made by the same entity you are acting on behalf of, you may not add another; but you may replace the old one, on explicit permission from the previous publisher that added the old one.

The author(s) and publisher(s) of the Document do not by this License give permission to use their names for publicity for or to assert or imply endorsement of any Modified Version.

5. COMBINING DOCUMENTS

You may combine the Document with other documents released under this License, under the terms defined in section 4 above for modified versions, provided that you include in the combination all of the Invariant Sections of all of the original documents, unmodified, and list them all as Invariant Sections of your combined work in its license notice, and that you preserve all their Warranty Disclaimers.

The combined work need only contain one copy of this License, and multiple identical Invariant Sections may be replaced with a single copy. If there are multiple Invariant Sections with the same name but different contents, make the title of each such section unique by adding at the end of it, in parentheses, the name of the original author or publisher of that section if known, or else a unique number. Make the same adjustment to the section titles in the list of Invariant Sections in the license notice of the combined work.

In the combination, you must combine any sections Entitled "History" in the various original documents, forming one section Entitled "History"; likewise combine any sections Entitled "Acknowledgements", and any sections Entitled "Dedications". You must delete all sections Entitled "Endorsements".

6. COLLECTIONS OF DOCUMENTS

You may make a collection consisting of the Document and other documents released under this License, and replace the individual copies of this License in the various documents with a single copy that is included in the collection, provided that you follow the rules of this License for verbatim copying of each of the documents in all other respects.

You may extract a single document from such a collection, and distribute it individually under this License, provided you insert a copy of this License into the extracted document, and follow this License in all other respects regarding verbatim copying of that document.

7. AGGREGATION WITH INDEPENDENT WORKS

A compilation of the Document or its derivatives with other separate and independent documents or works, in or on a volume of a storage or distribution medium, is called an "aggregate" if the copyright resulting from the compilation is not used to limit the legal rights of the compilation's users beyond what the individual works permit. When the Document is included in an aggregate, this License does not apply to the other works in the aggregate which are not themselves derivative works of the Document.

If the Cover Text requirement of section 3 is applicable to these copies of the Document, then if the Document is less than one half of the entire aggregate, the Document's Cover Texts may be placed on covers that bracket the Document within the aggregate, or the electronic equivalent of covers if the Document is in electronic form. Otherwise they must appear on printed covers that bracket the whole aggregate.

8. TRANSLATION

Translation is considered a kind of modification, so you may distribute translations of the Document under the terms of section 4. Replacing Invariant Sections with translations requires special permission from their copyright holders, but you may include translations of some or all Invariant Sections in addition to the original versions of these Invariant Sections. You may include a translation of this License, and all the license notices in the Document, and any Warranty Disclaimers, provided that you also include the original English version of this License and the original versions of those notices and disclaimers. In case of a disagreement between the translation and the original version of this License or a notice or disclaimer, the original version will prevail.

If a section in the Document is Entitled "Acknowledgements", "Dedications", or "History", the requirement (section 4) to Preserve its Title (section 1) will typically require changing the actual title.

9. TERMINATION

You may not copy, modify, sublicense, or distribute the Document except as expressly provided for under this License. Any other attempt to copy, modify, sublicense or distribute the Document is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

10. FUTURE REVISIONS OF THIS LICENSE

The Free Software Foundation may publish new, revised versions of the GNU Free Documentation License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns. See <https://www.gnu.org/copyleft/>.

Each version of the License is given a distinguishing version number. If the Document specifies that a particular numbered version of this License "or any later version" applies to it, you have the option of following the terms and conditions either of that specified version or of any later version that has been published (not as a draft) by the Free Software Foundation. If the Document does not specify a version number of this License, you may choose any version ever published (not as a draft) by the Free Software Foundation.

ADDENDUM: How to use this License for your documents

```
Copyright (c) YEAR YOUR NAME.  
Permission is granted to copy, distribute and/or modify this document  
under the terms of the GNU Free Documentation License, Version 1.2  
or any later version published by the Free Software Foundation;  
with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts.  
A copy of the license is included in the section entitled "GNU  
Free Documentation License".
```

If you have Invariant Sections, Front-Cover Texts and Back-Cover Texts, replace the “with...Texts.” line with this:

```
with the Invariant Sections being LIST THEIR TITLES, with the
Front-Cover Texts being LIST, and with the Back-Cover Texts being LIST.
```

If you have Invariant Sections without Cover Texts, or some other combination of the three, merge those two alternatives to suit the situation.

If your document contains nontrivial examples of program code, we recommend releasing these examples in parallel under your choice of free software license, such as the GNU General Public License, to permit their use in free software.