Red Hat Enterprise Linux 9

Customizing the GNOME desktop environment

Customizing the GNOME desktop environment on Red Hat Enterprise Linux 9
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Abstract

This document describes how to customize GNOME, which is the only desktop environment available in RHEL 9. It covers the instructions for users and system administrators for configuring GNOME to meet various use cases.
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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.
PROVIDING FEEDBACK ON RED HAT DOCUMENTATION

We appreciate your feedback on our documentation. Let us know how we can improve it.

Submitting comments on specific passages

1. View the documentation in the Multi-page HTML format and ensure that you see the Feedback button in the upper right corner after the page fully loads.

2. Use your cursor to highlight the part of the text that you want to comment on.

3. Click the Add Feedback button that appears near the highlighted text.

4. Add your feedback and click Submit.

Submitting feedback through Bugzilla (account required)

1. Log in to the Bugzilla website.

2. Select the correct version from the Version menu.

3. Enter a descriptive title in the Summary field.

4. Enter your suggestion for improvement in the Description field. Include links to the relevant parts of the documentation.

5. Click Submit Bug.
CHAPTER 1. ENABLING DESKTOP ICONS

You can enable the desktop icons functionality and move files to the desktop.

1.1. DESKTOP ICONS IN RHEL 9

Desktop icons are provided by the Desktop icons GNOME Shell extension, which is available from the gnome-shell-extension-desktop-icons package.

Desktop icons in GNOME Classic

The GNOME Classic environment includes the gnome-shell-extension-desktop-icons package by default. Desktop icons are always on, and you cannot turn them off.

Desktop icons in GNOME Standard

In GNOME Standard, desktop icons are disabled by default.

To enable desktop icons in the GNOME Standard environment, you must install the gnome-shell-extension-desktop-icons package.

1.2. ENABLING DESKTOP ICONS IN GNOME STANDARD

This procedure enables the desktop icons functionality in the GNOME Standard environment.

Prerequisites

- The Extensions application is installed on the system:

  # dnf install gnome-shell-extension-desktop-icons

Procedure

1. Open the Extensions application.

2. Enable the Desktop Icons extension.
1.3. CREATING A DESKTOP ICON FOR A FILE

This procedure creates a desktop icon for an existing file.

Prerequisites

- The Desktop icons extension is enabled.

Procedure

- Move the selected file into the ~/Desktop/ directory.

Verification steps

- Check that the icon for the file appears on the desktop.
CHAPTER 2. 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 (+).
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 launching applications, see Launching applications in GNOME
CHAPTER 3. RESTRICTING THE SESSION TO A SINGLE APPLICATION

You can start the GNOME session in single-application mode, also known as kiosk mode. In this session, GNOME displays only a full-screen window of the application that you have selected.

3.1. SINGLE-APPLICATION MODE

Single-application mode is a modified GNOME session that reconfigures the Mutter window manager into an interactive kiosk. This session locks down certain behavior to make the standard desktop more restrictive. The user can interact only with a single application selected by the administrator.

You can set up single-application mode for several use cases, such as:

- In the communication, entertainment, or education fields
- As a self-serve machine
- As an event manager
- As a registration point

The GNOME Kiosk utility provides the single-application mode configuration and sessions.

The following single-application sessions are available:

- **Search Appliance Session**
  - This session always starts the Mozilla Firefox web browser at the www.google.com website.
- **Kiosk Script Session**
  - This session starts an arbitrary application that you specify in a shell script.

3.2. ENABLING SEARCH APPLIANCE MODE

This procedure installs and enables the Search Appliance Session, which restricts the GNOME session to the Google search engine in a web browser.

Procedure

1. Install the GNOME Kiosk packages:

   ```
   # dnf install gnome-kiosk gnome-kiosk-search-appliance
   ```

2. At the GNOME login screen, select **Search Appliance Session** from the gear button menu and log in as the single-application user.

3. The Mozilla Firefox browser opens as a full-screen window in its kiosk mode. It shows the Google search page.

Additional resources

- The `/usr/share/doc/gnome-kiosk/README.md` file provided by the `gnome-kiosk` package.
3.3. ENABLING SINGLE-APPLICATION MODE

This procedure installs and enables the Kiosk Script Session, which restricts the GNOME session to a selected single application.

Procedure

1. Install the GNOME Kiosk packages:

   ```
   # dnf install gnome-kiosk gnome-kiosk-script-session
   ```

2. At the GNOME login screen, select Kiosk Script Session from the gear button menu and log in as the single-application user.

3. The gedit text editor opens as a full-screen window. It shows the shell script that configures which application runs in your single-application session. Edit the shell script and enter the application that you want to start in the single-application session.

   For example, to start the Mozilla Firefox browser, enter the following content:

   ```
   #!/usr/bin/sh
   firefox --kiosk https://example.org
   ```

4. Save the script file.

5. Close the gedit window.

   The session terminates and restarts with your selected application.

6. The next time you log into the single-application session, your selected application runs.

Additional resources

- The /usr/share/doc/gnome-kiosk/README.md file provided by the gnome-kiosk package.
CHAPTER 4. CONFIGURING SOUND IN GNOME

You can configure sound volume and other sound options in GNOME.

4.1. SOUND CONFIGURATION TOOLS IN GNOME

In RHEL 9, the PipeWire sound server handles sound output and input. PipeWire lets programs output the audio using the pipewire daemon.

To configure sound, you can use one of the following graphical applications in GNOME:

System menu

The system menu is located in the top-right screen corner. It enables you only to set the intensity of the sound output or sound input through the sound bar. The sound bar for input sound is available only if you are running an application that is using an internal microphone (built-in audio), such as some teleconference tools.

Settings

Settings provides other general options to configure sound.

Tweaks

The Tweaks application enables you to configure only volume over-amplification.
For more information about PipeWire, see the pipewire man page.

4.2. ACCESSING SOUND CONFIGURATION IN SETTINGS

This procedure opens the sound configuration screen in the Settings.

1. Launch Settings. You can use one of the approaches described in Launching applications in GNOME. Alternatively, you can also launch it from the system menu by clicking on its icon.

2. In Settings, choose Sound from the left vertical bar.
4.3. SOUND OPTIONS IN SETTINGS

Through the Sound menu in Settings, you can configure the following sound options:

Volume Levels

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

Output and Input

The Output and Input sections show all built-in audio devices and external audio devices that are currently connected.

Alert sound

The Alert sound section shows different themes of system audio alerts.

The Output section on the sound configuration screen
CHAPTER 5. DISPLAYING THE SYSTEM SECURITY CLASSIFICATION

As an administrator of deployments where the user must be aware of the security classification of the system, you can set up a notification of the security classification. This can be either a permanent banner or a temporary notification, and it can appear on login screen, in the GNOME session, and on the lock screen.

5.1. ENABLING SYSTEM SECURITY CLASSIFICATION BANNERS

You can create a permanent classification banner to state the overall security classification level of the system. This is useful for deployments where the user must always be aware of the security classification level of the system that they are logged into.

The permanent classification banner can appear within the running session, the lock screen, and login screen, and customize its background color, its font, and its position within the screen.

This procedure creates a red banner with a white text placed on both the top and bottom of the login screen.

Procedure

1. Install the `gnome-shell-extension-classification-banner` package:
   
   ```bash
   # dnf install gnome-shell-extension-classification-banner
   ```

2. Create the `99-class-banner` file at either of the following locations:

   - To configure a notification at the login screen, create `/etc/dconf/db/gdm.d/99-class-banner`.
   - To configure a notification in the user session, create `/etc/dconf/db/local.d/99-class-banner`.

3. Enter the following configuration in the created file:

   ```
   [org/gnome/shell]
   enabled-extensions=["classification-banner@gnome-shell-extensions.gcampax.github.com"]

   [org/gnome/shell/extensions/classification-banner]
   background-color='rgba(200,16,46,0.75)'
   message='TOP SECRET'
   top-banner=true
   bottom-banner=true
   system-info=true
   color='rgb(255,255,255)'
   ```
WARNING

This configuration overrides similar configuration files that also enable an extension, such as Notifying of the system security classification.

To enable multiple extensions, specify all of them in the enabled-extensions list. For example:

```bash
enabled-extensions=['heads-up-display@gnome-shell-extensions.gcampax.github.com', 'classification-banner@gnome-shell-extensions.gcampax.github.com']
```

4. Update the dconf database:

```bash
# dconf update
```

5. Reboot the system.

Troubleshooting

- If the classification banners are not displayed for an existing user, log in as the user and enable the Classification banner extension using the Extensions application.

5.2. NOTIFYING OF THE SYSTEM SECURITY CLASSIFICATION

You can set up a notification that contains a predefined message in an overlay banner. This is useful for deployments where the user is required to read the security classification of the system before logging in.

Depending on your configuration, the notification can appear at the login screen, after logging in, on the lock screen, or after a longer time with no user activity. You can always dismiss the notification when it appears.

Procedure

1. Install the gnome-shell-extension-heads-up-display package:

```bash
# dnf install gnome-shell-extension-heads-up-display
```

2. Create the 99-hud-message file at either of the following locations:

   - To configure a notification at the login screen, create /etc/dconf/db/gdm.d/99-hud-message.
   - To configure a notification in the user session, create /etc/dconf/db/local.d/99-hud-message.

3. Enter the following configuration in the created file:
Replace the following values with text that describes the security classification of your system:

**Security classification title**
A short heading that identifies the security classification.

**Security classification description**
A longer message that provides additional details, such as references to various guidelines.

---

**WARNING**
This configuration overrides similar configuration files that also enable an extension, such as [Enabling system security classification banners](#).

To enable multiple extensions, specify all of them in the `enabled-extensions` list. For example:

```ini
enabled-extensions=['heads-up-display@gnome-shell-extensions.gcampax.github.com', 'classification-banner@gnome-shell-extensions.gcampax.github.com']
```

4. Update the `dconf` database:

```
# dconf update
```

5. Reboot the system.

**Troubleshooting**

- If the notifications are not displayed for an existing user, log in as the user and enable the **Heads-up display message** extension using the **Extensions** application.
CHAPTER 6. ENABLING ACCESSIBILITY FOR VISUALLY IMPAIRED USERS

As a system administrator, you can configure the desktop environment to support users with a visual impairment.

To enable accessibility, perform the following procedures.

6.1. COMPONENTS THAT PROVIDE ACCESSIBILITY FEATURES

On the Red Hat Enterprise Linux 9 desktop, the Orca screen reader ensures accessibility for users with a visual impairment. Orca is included in the default RHEL installation.

Orca reads information from the screen and communicates it to you using the following components:

Speech Dispatcher
Orca uses Speech Dispatcher to communicate with the speech synthesizer. Speech Dispatcher supports various speech synthesis backends, ensures that messages from other applications do not interrupt the messages from Orca, and provides other functionality.

Speech synthesizer
Provides a speech output. The default speech synthesizer is eSpeak-NG.

Braille display
Provides a tactile output. The BRLTTY service enables this functionality.

Additional resources
- Orca help page

6.2. ENABLING THE ACCESSIBILITY MENU

You can enable the Accessibility menu icon in the top panel, which provides a menu with several accessibility options.

Procedure

1. Open the Settings application.

2. Select Accessibility.

3. Enable the Always Show Accessibility Menu item.

Enabling the Accessibility menu in Settings
Verification

- Check that the **Accessibility menu** icon is displayed on the top bar even when all options from this menu are switched off.

6.3. ENABLING THE SCREEN READER

You can enable the **Orca** screen reader in your desktop environment. The screen reader then reads the text displayed on the screen to improve accessibility.

**Procedure**

- Enable the screen reader using either of the following ways:
  
  - Press the **Super+Alt+S** keyboard shortcut.
  
  - If the top panel shows the **Universal Access** menu, select **Screen Reader** in the menu.

**Verification**

1. Open an application with text content.

2. Check that the screen reader reads the text in the application.
6.4. ENABLING A BRAILLE DISPLAY DEVICE

The Braille display is a device that uses the brltty service to provide tactile output for visually impaired users.

In order for the Braille display to work correctly, perform the following procedures.

6.4.1. Supported types of Braille display device

The following types of Braille display devices are supported on Red Hat Enterprise Linux 9.

Table 6.1. Braille display device types and the corresponding syntax

<table>
<thead>
<tr>
<th>Braille device type</th>
<th>Syntax of the type</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial device</td>
<td>serial:path</td>
<td>Relative paths are at /dev.</td>
</tr>
<tr>
<td>USB device</td>
<td>[serial-number]</td>
<td>The brackets ([]) here indicate optionality.</td>
</tr>
<tr>
<td>Bluetooth device</td>
<td>bluetooth:address</td>
<td></td>
</tr>
</tbody>
</table>

6.4.2. Enabling the brltty service

To enable the Braille display, enable the brltty service to start automatically on boot. By default, brltty is disabled.

Prerequisites

- Ensure that the brltty package is installed:
  
  # dnf install brltty

- Optionally, you can install speech synthesis support for brltty:

  # dnf install brltty-espeak-ng

Procedure

- Enable the brltty service to start on boot:

  # systemctl enable --now brltty

Verification steps

1. Reboot the system.

2. Check that the brltty service is running:

  # systemctl status brltty
  • brltty.service - Braille display driver for Linux/Unix
6.4.3. Authorizing users of a Braille display device

To use a Braille display device, you must set the users who are authorized to use the Braille display device.

**Procedure**

1. In the `/etc/brltty.conf` file, ensure that `keyfile` is set to `/etc/brlapi.key`:

```bash
api-parameters Auth=keyfile:/etc/brlapi.key
```

This is the default value. Your organization might have overridden it.

2. Authorize the selected users by adding them to the `brlapi` group:

```bash
# usermod --append -G brlapi user-name
```

**Additional resources**

- [Editing user groups using the command line](#)

6.4.4. Setting the driver for a Braille display device

The `brltty` service automatically chooses a driver for your Braille display device. If the automatic detection fails or takes too long, you can set the driver manually.

**Prerequisites**

- The automatic driver detection has failed or takes too long.

**Procedure**

1. Open the `/etc/brltty.conf` configuration file.

2. Find the `braille-driver` directive, which specifies the driver for your Braille display device.

3. Specify the identification code of the required driver in the `braille-driver` directive. Choose the identification code of required driver from the list provided in `/etc/brltty.conf`. For example, to use the XWindow driver:

```bash
# XWindow
braille-driver xw
```
To set multiple drivers, list them separated by commas. Automatic detection then chooses from the listed drivers.

6.4.5. Connecting a Braille display device

The **brlty** service automatically connects to your Braille display device. If the automatic detection fails, you can set the connection method manually.

**Prerequisites**

- The Braille display device is physically connected to your system.
- The automatic connection has failed.

**Procedure**

1. If the device is connected by a serial-to-USB adapter, find the actual device name in the kernel messages on the device plug:

   ```
   # journalctl --dmesg | fgrep ttyUSB
   ```

2. Open the `/etc/brlty.conf` configuration file.

3. Find the **braille-device** directive.

4. In the **braille-device** directive, specify the connection.
   You can also set multiple devices, separated by commas, and each of them will be probed in turn.

   For example:

   **Example 6.1. Settings for the first serial device**

   ```
   braille-device serial:ttys0
   ```

   **Example 6.2. Settings for the first USB device matching Braille driver**

   ```
   braille-device usb:
   ```

   **Example 6.3. Settings for a specific USB device by serial number**

   ```
   braille-device usb:nnnnn
   ```

   **Example 6.4. Settings for a serial-to-USB adapter**

   Use the device name that you found earlier in the kernel messages:

   ```
   braille-device serial:ttys0
   ```
NOTE

Setting `braille-device` to `usb` does not work for a serial-to-USB adapter.

Example 6.5. Settings for a specific Bluetooth device by address

```
```

6.4.6. Setting the text table

The `brltty` service automatically selects a text table based on your system language. If your system language does not match the language of a document that you want to read, you can set the text table manually.

Procedure

1. Edit the `/etc/brltty.conf` file.

2. Identify the code of your selected text table.
   You can find all available text tables in the `/etc/brltty/Text/` directory. The code is the file name of the text table without its file suffix.

3. Specify the code of the selected text table in the `text-table` directive.
   For example, to use the text table for American English:

   ```
   text-table en_US  # English (United States)
   ```

6.4.7. Setting the contraction table

You can select which table is used to encode the abbreviations with a Braille display device. Relative paths to particular contraction tables are stored within the `/etc/brltty/Contraction/` directory.

WARNING

If no table is specified, the `brltty` service does not use a contraction table.

Procedure

- Choose a contraction table from the list in the `/etc/brltty.conf` file.
  For example, to use the contraction table for American English, grade 2:

  ```
  contraction-table en-us-g2  # English (US, grade 2)
  ```