2 Quick start

Want to submit a patch for LilyPond? Great! Never created a patch before? Never compiled software before? No problem! This chapter is for you and will help you do this as quickly and easily as possible.

2.1 LilyDev

> **Note:** The following sections are based on LilyDev v1 and are not necessarily correct for different releases.

"LilyDev" is a custom GNU/Linux operating system which includes all the necessary software and tools to compile LilyPond, the documentation and the website (also see Chapter 6 [Website work], page 86). It is also prepared for building the [Grand Unified Builder (GUB)], page 20, though this is an involved process and may require further tweaking.

While compiling LilyPond on Mac OS and Windows is possible, both environments are complex to set up. LilyDev can be easily run inside a 'virtual machine' on either of these operating systems relatively easily using readily available virtualization software. We recommend using VirtualBox as it is available for all major operating systems and is very easy to install & configure.

LilyDev comes in two 'flavours': containers and a standard disk image. Windows or Mac OS users should choose the Debian disk image (to be run in a virtual machine), that is the file named `lilydev-vm-debian-VERSION`. GNU/Linux users are recommended to choose one of the containers (currently Debian or Fedora), which are smaller in size, lightweight and easier to manage. The Fedora disk image has currently not been released, you can create it from the sources located in the /mkosi subdirectory of the LilyDev repository, however.

Download the appropriate file from here:

`https://github.com/fedelibre/LilyDev/releases/latest`

> **Note:** Apart from installing and configuring LilyDev in VirtualBox, the rest of the chapter assumes that you are comfortable using the command-line and is intended for users who may have never created a patch or compiled software before. More experienced developers (who prefer to use their own development environment) may still find it instructive to skim over the following information.

If you are not familiar with GNU/Linux, it may be beneficial to read a few "introduction to Linux" type web pages.

Installing LilyDev in VirtualBox

This section discusses how to install and use LilyDev with VirtualBox.

> **Note:** If you already know how to install a virtual machine using a disc image inside VirtualBox (or your own virtualization software) then you can skip this section and go straight to Section 2.2 [lily-git], page 7.

1. Download VirtualBox from here:

   `http://www.virtualbox.org/wiki/Downloads`

> **Note:** In virtualization terminology, the operating system where VirtualBox is installed is known as the **host**. LilyDev will be installed 'inside' VirtualBox as a **guest**.

2. The zip archive you downloaded containes the raw disk image and its SHA256 checksum. You can verify the integrity of the downloaded archive with any hashing tool your OS does support. On Linux, run the following command in the directory where you've extracted the files: (this may take some time)

   ```
   sha256sum -c SHA256SUMS
   ```

   For Windows, look for the tools **FCIV** or **certutil** to compute the archive's hash.

3. As VirtualBox does not support the raw format, you'll have to extract it and then convert it to VDI format. Make sure that 'VBoxManage' is in your PATH or call it from your VirtualBox installation directory:

   ```
   VBoxManage convertfromraw lilydev-vm-debian-VERSION.raw lilydev-vm-debian-VERSION.vdi
   ```

   > **Note:** You will need a fair amount of disk space (~30 GB) to extract the raw image. After converting to a dynamic VirtualBox image it will take up much less space (only the amount of space that is actually allocated by the guest filesystem)

4. Start the VirtualBox software and click 'New' to create a new "virtual machine".

   The 'New Virtual Machine Wizard' will walk you through setting up your guest virtual machine. Choose an appropriate name for your LilyDev installation and select the 'Linux' operating system. When selecting the 'version' choose 'Debian (64 bit)'. If you do not have that specific option choose 'Linux 2.6/3.x/4.x (64-bit)'.

5. Select the amount of RAM you will allow the LilyDev guest to use from your host operating system when it is running. If possible, use at least 1 GB of RAM; the more RAM you can spare from your host the better

6. In the 'Hard Disk' step, you'll use the VDI file you've previously created. You may move it within the virtual machine's folder already created by the wizard (in GNU/Linux the default should be `~/VirtualBox VMs/NAME`). Click on 'Use an existing virtual hard disk file' and browse to the VDI file.

7. Verify the summary details and click 'Create', when you are satisfied. Your new guest will be displayed in the VirtualBox window.

8. Enable EFI within the virtual machine's settings – click on System → Motherboard and select 'Extended features: Enable EFI'. Otherwise you won't be able to boot the image.

9. VirtualBox 'guest additions', which are installed by default in the debian image, provide some additional features such as being able to dynamically resize the LilyDev window, allow seamless interaction with your mouse pointer on both the host and guest and let you copy/paste between your host and guest if needed. It seems that dynamic window resizing works only with the 'VBoxVGA' graphics controller, which you can choose in Display → Graphics Controller. To enable clipboard sharing between guest and host, choose General → Advanced → Shared Clipboard → Bidirectional.

10. Click the 'Start' button and wait until the login screen appears. You'll log in as `dev` user; type the password `lilypond`. Before starting any work, be sure to complete the next steps.

    > **Note:** Since the default keyboard layout is US (american), you may have to type the password differently if you are using another layout, like e.g. 'lilzpond' on a German keyboard.

11. You might need to change the keybord layout from default US (american) to your national layout. Therefore open a terminal and run

    ```
    sudo dpkg-reconfigure keyboard-layout
    ```

12. To setup your system language(charset, localized messages etc.), continue with

    ```
    sudo dpkg-reconfigure locales
    ```

13. Finally you should run a setup script. If you're on the command line already, simply type `./setup.sh` to run the interactive script which will set up git and download all the repositories needed to build LilyPond.

Configuring LilyDev in VirtualBox

- In the settings for the virtual machine, set the network to Bridged mode to allow you to access shared folders when using Windows hosts.
- Set up any additional features, such as 'Shared Folders' between your main operating system and LilyDev. This is distinct from the networked share folders in Windows. Consult the external documentation for this.

  Some longtime contributors have reported that 'shared folders' are rarely useful and not worth the fuss, particularly since files can be shared over a network instead.
- Pasting into a terminal is done with `Ctrl+Shift+v`.
- Right-click allows you to edit a file with the text editor (default is Leafpad).

Known issues and warnings

Not all hardware is supported in all virtualization tools. In particular, some contributors have reported problems with USB network adapters. If you have problems with network connection (for example Internet connection in the host system is lost when you launch virtual system), try installing and running LilyDev with your computer's built-in network adapter used to connect to the network. Refer to the help documentation that comes with your virtualization software.

2.2 lily-git

The 'LilyPond Contributor's Git Interface' (otherwise known as `lily-git.tcl`) is a simple-to-use GUI to help you download and update the LilyPond source code as well as an aid to making software patches.

Where to get lily-git

Depending on your development environment, lily-git may already be installed on your computer.

- If you are using LilyDev (see Section 2.1 [LilyDev], page 5) then lily-git should already be installed and ready to run. If this is not the case you can easily turn it on by adding the following line in `~/.bashrc`:

  ```
  # add lily-git to the PATH
  PATH=$LILYPOND_GIT/scripts/auxiliar:"${PATH}"
  ```

- For those not using LilyDev, lily-git can be obtained by downloading the software directly. See Section 3.1 [Manually installing lily-git.tcl], page 14.
- lily-git is part of the LilyPond source code and is located in `$LILYPOND_GIT/scripts/auxiliar/lily-git.tcl`.

Using lily-git to download the source code

1. Type the following command into a Terminal:

   ```
   lily-git.tcl
   ```