

# How to Install and Run Multiple glibc Libraries in Linux

Ravi Saive | June 13, 2024 | Read Time: 2 mins | [Linux Commands](#) | [3 Comments](#)

The GNU C Library (glibc) is a fundamental component of the [Linux operating system](#), providing essential functionality for various applications.

In some cases, you may need to install multiple versions of glibc to support different applications or to ensure compatibility with older software.

This guide will show you how to install and manage multiple glibc libraries on your Linux system using simple steps.

## Understanding the Need for Multiple glibc Libraries

The primary reason for installing multiple glibc libraries is to support different applications that require different versions of the library.

This can occur when you need to run older software that is not compatible with the latest version of glibc. For instance, some older applications might rely on specific features or functions that were available in earlier versions of glibc.

## Step 1: Installing the Required Packages

Before installing multiple glibc libraries, ensure that your system is up to date.

```
sudo apt update      [On Debian-based Systems]
sudo yum update      [On RedHat-based Systems]
```

Next, install the required necessary packages for building and installing glibc on [Debian-based distributions](#).

```
sudo apt install build-essential libssl-dev libgdbm-dev libdb-dev libexpat-
```



The screenshot shows a terminal window titled 'TecMint.com'. The user 'ravi' is at the prompt. They run the command: `sudo apt install build-essential libssl-dev libgdbm-dev libdb-dev libexpat-dev libncurses5-dev libbz2-dev zlib1g-dev`. The terminal output shows the password prompt, package list reading, dependency tree building, and state information reading. It notes that 'libexpat1-dev' is selected instead of 'libexpat-dev' and 'libncurses-dev' instead of 'libncurses5-dev'. It also states that 'build-essential' and 'zlib1g-dev' are already the newest versions and are set to manually installed. The following additional packages will be installed: 'bzip2-doc', 'libdb5.3-dev'. Suggested packages: 'db5.3-doc', 'ncurses-doc', 'libssl-doc'.

Install Required Packages

For [RedHat-based distributions](#), install the Development Tools package.

```
sudo yum groupinstall "Development Tools"
```

## Step 2: Installing Multiple glibc Libraries

To install multiple glibc libraries, you will need to compile and install each version separately as shown.

First, download the required versions of glibc from the [official glibc repository](#) or a reliable source, or use the following [wget command](#) to download the glibc 2.39 and glibc 2.38 versions.

```
wget https://ftp.gnu.org/gnu/glibc/glibc-2.39.tar.xz
wget https://ftp.gnu.org/gnu/glibc/glibc-2.38.tar.bz2
```

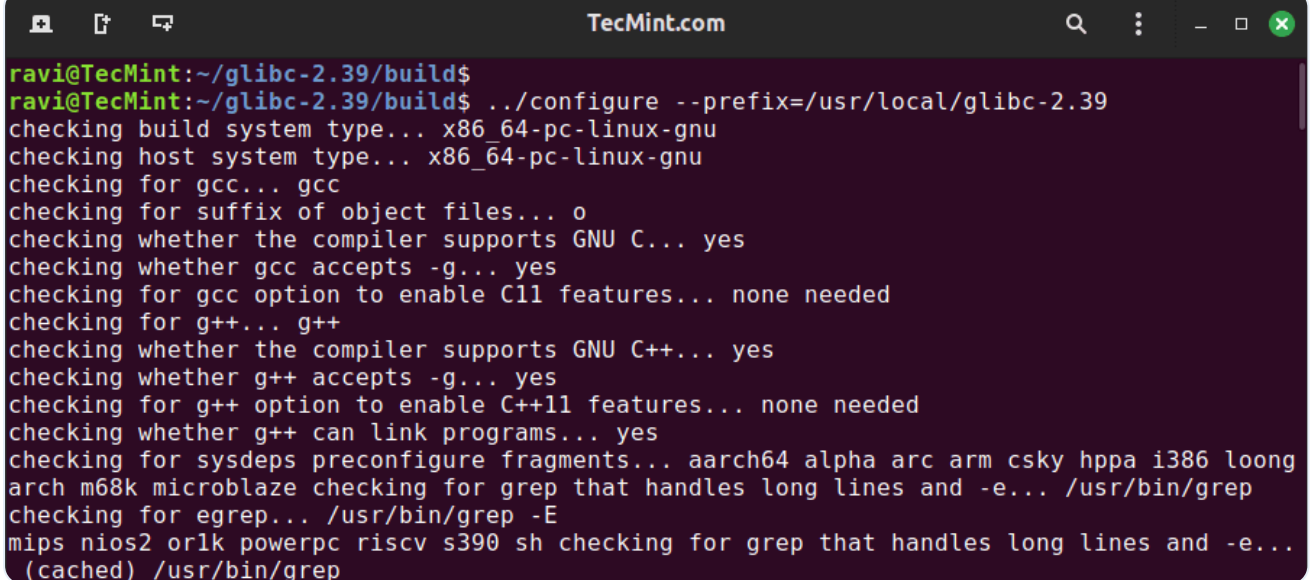
Next, extract the downloaded source code using the following [tar command](#), which will create a new directory containing the glibc source code.

```
tar -xvf glibc-2.39.tar.xz
tar -xvf glibc-2.38.tar.xz
```

Navigate to the extracted directory and run the following command to configure the build and install glibc, which allows you to install multiple versions of glibc without conflicts.

For glibc 2.39:

```
cd glibc-2.39
mkdir build
cd build
../configure --prefix=/usr/local/glibc-2.39
make -j4
sudo make install
```

A terminal window titled "TecMint.com" showing the configuration and compilation of glibc 2.39. The user is in the directory ~/glibc-2.39/build. The terminal output shows the configuration script checking various system types, compilers, and options. It successfully configures for x86\_64-pc-linux-gnu with gcc and g++ compilers. The compilation is then performed with make -j4.

```
ravi@TecMint:~/glibc-2.39/build$
ravi@TecMint:~/glibc-2.39/build$ ../configure --prefix=/usr/local/glibc-2.39
checking build system type... x86_64-pc-linux-gnu
checking host system type... x86_64-pc-linux-gnu
checking for gcc... gcc
checking for suffix of object files... o
checking whether the compiler supports GNU C... yes
checking whether gcc accepts -g... yes
checking for gcc option to enable C11 features... none needed
checking for g++... g++
checking whether the compiler supports GNU C++... yes
checking whether g++ accepts -g... yes
checking for g++ option to enable C++11 features... none needed
checking whether g++ can link programs... yes
checking for sysdeps preconfigure fragments... aarch64 alpha arc arm csky hppa i386 loong
arch m68k microblaze checking for grep that handles long lines and -e... /usr/bin/grep
checking for egrep... /usr/bin/grep -E
mips nios2 orlk powerpc riscv s390 sh checking for grep that handles long lines and -e...
(cached) /usr/bin/grep
```

Build Glibc in Linux

For glibc 2.38:

```
cd glibc-2.38
mkdir build
cd build
../configure --prefix=/usr/local/glibc-2.38
make -j4
sudo make install
```

## Managing Multiple glibc Libraries

After installing multiple glibc libraries, you need to manage them to ensure that the correct version is used by your applications.

To use a specific glibc version, you need to set the `LD_LIBRARY_PATH` environment variable.

For glibc 2.39:

```
export LD_LIBRARY_PATH=/usr/local/glibc-2.39/lib:$LD_LIBRARY_PATH
```

For glibc 2.38:

```
export LD_LIBRARY_PATH=/usr/local/glibc-2.38/lib:$LD_LIBRARY_PATH
```

You can add these lines to your `.bashrc` or `.profile` file to make the changes permanent.

Finally, check the glibc version to ensure it's correctly installed.

```
/usr/local/glibc-2.39/lib/ld-2.30.so --version
/usr/local/glibc-2.38/lib/ld-2.31.so --version
```

## Run Applications with Specific glibc Versions

To run an application with a specific glibc version, use the `LD_PRELOAD` environment variable.

For example, to run an application with glibc 2.39, use.

```
LD_PRELOAD=/usr/local/glibc-2.39/lib/ld-2.30.so ./your_application
```

## Conclusion

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By following these steps, you can install and manage multiple glibc versions on your Linux system, which allows you to run applications that depend on different glibc versions without interfering with your system's default libraries.

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## Ravi Saive

I am an experienced GNU/Linux expert and a full-stack software developer with over a decade in the field of Linux and Open Source technologies

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```
tecmin@tecmin ~/testing $ find . -type f \( -name "*.txt" -o -  
name "*.sh" -o -name "*.c" \)  
./emails.txt  
./script-1.sh  
./header.c  
./examples.txt  
./script.sh  
./expenses.txt
```

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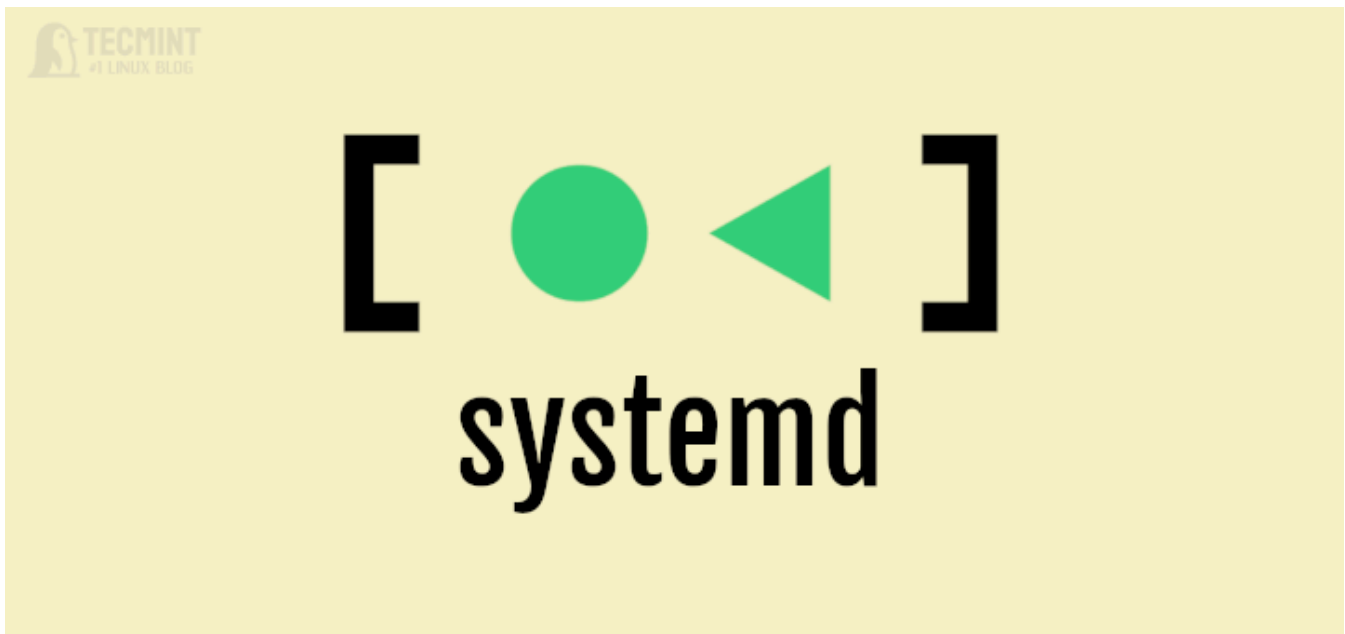




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```
ravi@TecMint:~$  
ravi@TecMint:~$ sudo snap install vlc --channel=latest/stable  
[sudo] password for ravi:  
vlc 3.0.20-1-g2617de71b6 from VideoLAN** installed  
ravi@TecMint:~$  
ravi@TecMint:~$ snap list vlc  
Name Version Rev Tracking Publisher Notes  
vlc 3.0.20-1-g2617de71b6 3777 latest/stable videolan** -  
ravi@TecMint:~$
```

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 **3 Comments**

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**Stefano Cacciatore**

August 7, 2024 at 2:15 pm

Hi,

I followed the script and was able to install both glibc-2.39 and glibc-2.38, but I do not have the file ld-2.30.so.

I tried to use the code with the file ld-linux-x86-64.so.2, but it failed.

```
LD_PRELOAD=/usr/local/glibc-2.38/lib/ld-linux-x86-64.so.2  
/opt/python/${PYTHON_VERSION}/bin/pip install ipykernel
```

Segmentation fault (core dumped)

[Reply](#)

Author



**Ravi Saive**

August 8, 2024 at 8:00 am

@Stefano,

This could be due to compatibility issues between the versions of glibc and your Python installation.

Verify that the version of ld-linux-x86-64.so.2 you are using is compatible with your installed glibc versions in the same directory.

```
ls /usr/local/glibc-2.38/lib/ld-linux-x86-64.so.2
```

You can try setting the `LD_LIBRARY_PATH` to include the glibc library path before running the pip install command.

```
export LD_LIBRARY_PATH=/usr/local/glibc-2.38/lib:$LD_LIBRARY_PATH  
/opt/python/${PYTHON_VERSION}/bin/pip install ipykernel
```

Another approach is to create a symbolic link to the required version of `ld-linux-x86-64.so.2` in the directory where your `ld-2.30.so` is expected.

```
ln -s /usr/local/glibc-2.38/lib/ld-linux-x86-64.so.2  
/usr/local/glibc-2.38/lib/ld-2.30.so
```

If the segmentation fault persists, you may want to debug it using `gdb`.

```
gdb --args /opt/python/${PYTHON_VERSION}/bin/python -m pip  
install ipykernel
```

[Reply](#)

**Jalal Hajigholamali**

July 8, 2024 at 2:28 pm

Hi,  
Thanks a lot  
very useful article

[Reply](#)

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