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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-
```

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
```

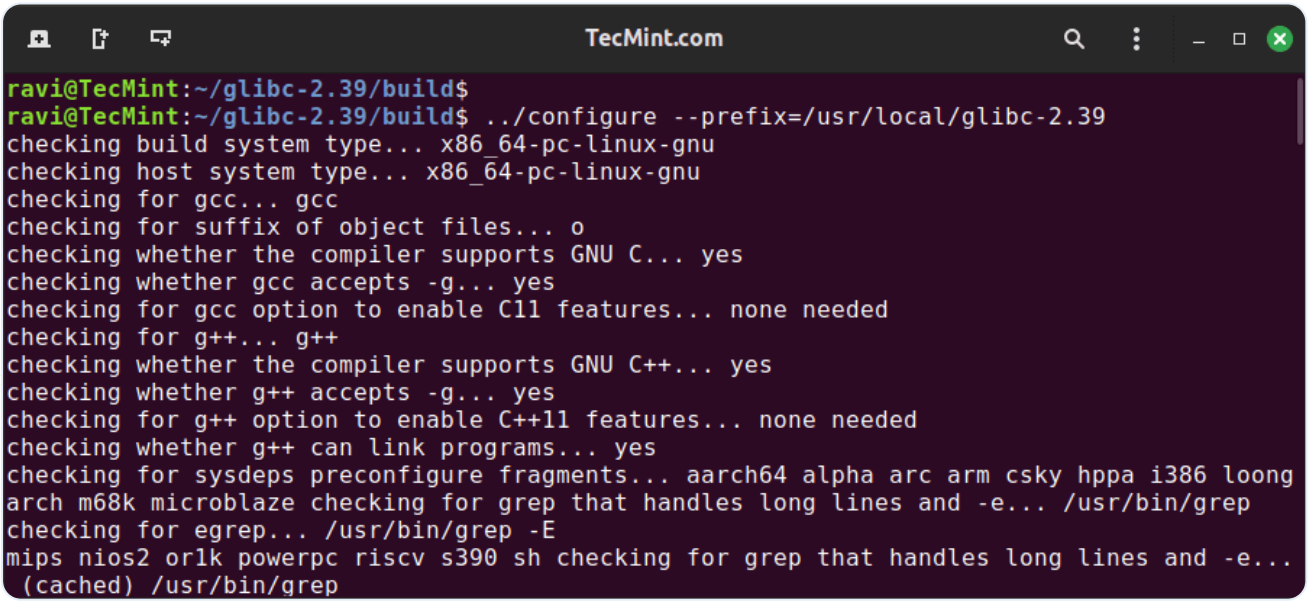
Next, extract the downloaded source code using the following tar command, which will create a new directory containing the **glibc** source code.

```
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
```



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

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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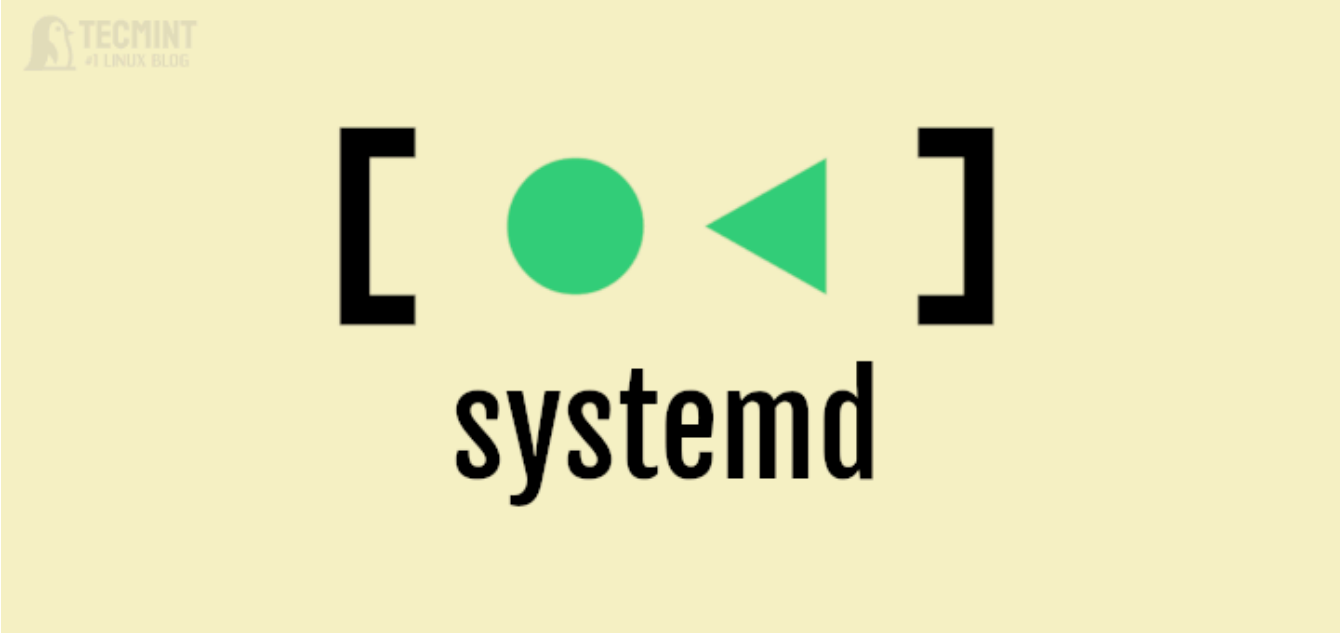

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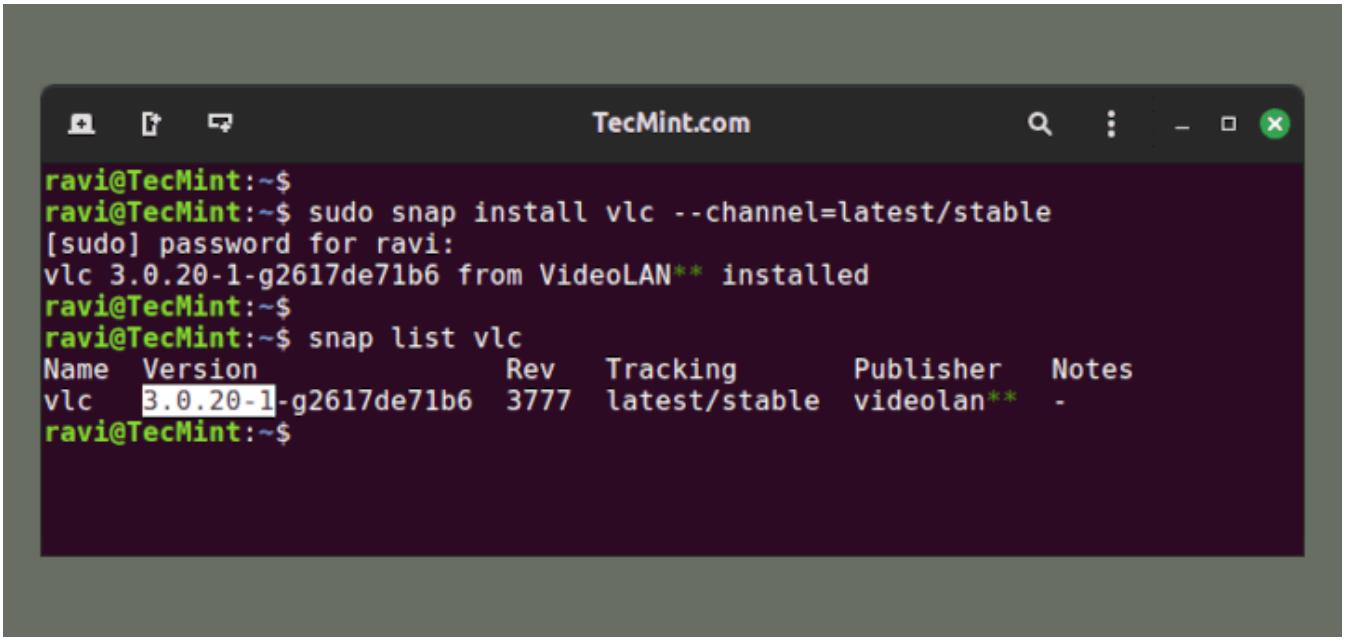

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3 Comments

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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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