

PhysioToolkit Installation Guide

This installation guide is based

on <http://www.physionet.org/physiotools/wfdb-linux-quick-start.shtml>, but some errors happen when installing this Toolkit. So some contents are added for solving these installing errors and some notes are made for your convenience.

WFDB QUICK START FOR GNU/LINUX

1. **Are you running a 32- or 64-bit Linux kernel?** Current versions of the WFDB Software Package can be compiled and installed on either 32- or 64-bit Linux, but the procedure for doing so depends on which you have. You can check this by running the command

```
2.  uname -m
```

If the output is `x86_64`, your CPU and Linux kernel are both 64-bit, and you should use version 10.4.9, or any later version, of the WFDB Software Package. Although some older versions of the WFDB Software Package can also be compiled and installed on 64-bit Linux, they are not fully supported (see [this note](#)).

3. **Install gcc** (requires root permissions) if it is not installed already (try the command `'gcc --version'` to check).

4. **Install an HTTP client library** (optional, requires root permissions) if one is not installed already (try the commands `'curl-config --version'` and `'libwww-config --version'` to check). If either command works, skip to the next step.

If neither [libcurl](#) nor [libwww](#) has been installed already, install one of them now. On Fedora and other RPM-based GNU/Linux distributions, the command `'yum install curl-devel'` downloads and installs `libcurl`; on Ubuntu and other Debian-based GNU/Linux distributions, `'apt-get install libcurl4-openssl-dev'` does the same thing.

- You will be able to use the WFDB software to read files on local disk drives and CD-ROMs whether or not you install one of these libraries.
- Direct access from WFDB applications to data files on remote web and FTP servers (NETFILES) is possible *only* if you install `libcurl` or `libwww`.
- Direct access from WFDB applications to password-protected data files on remote web and FTP servers requires `libcurl` 7.12.0 or later.
- If you skip this step now, you may install `libcurl` or `libwww` and recompile the WFDB library later to enable NETFILES access for all of your WFDB applications. It will not be necessary to recompile the applications themselves.

5. If (and only if) you are running a 32-bit Linux kernel, [install the X11 developer's toolkit and XView](#) (optional, requires root permissions) if they have not been installed already. (Check for the presence of `Xlib.h`, which is usually found in `/usr/include/X11`, to see if the X11 developer's toolkit has been installed. Check for the presence of `textedit`, which is usually found in `/usr/openwin/bin`, to see if XView has been installed.)

- You will not be able to compile or use WAVE unless you have installed the X11 developer's toolkit and XView, but none of the other WFDB applications require XView. Other components of PhysioToolkit, such as [plt](#) and [SEMIA](#), require X11 and XView.
- The X11 developer's toolkit is contained in a package named `libX11-devel` in most current GNU/Linux distributions, such as Fedora 5 and later. In some older GNU/Linux distributions, the package you need may be called `xorg-x11-devel` or `XFree86-devel`. On Ubuntu or Debian, use `'apt-get install libx11-dev'`.
- PhysioNet's [XView](#) pages contain sets of XView RPMs and instructions for installing them. Be sure to install not only the basic `xview` package, but also the `xview-clients` and `xview-devel` packages. On Ubuntu or Debian, `'apt-get install xvieg-dev'` suffices.

6. Download the current version of the WFDB software package as [sources](#) or [binaries](#). Binary packages are provided as a convenience and may not be up-to-date; we strongly recommend following the procedure described below for compiling the software from the sources instead. If you plan to compile WFDB applications that are not included in the binary package, please start with the sources.

If you download the sources (recommended):

- Unpack the archive of sources:

```
○ tar xfvz wfdb.tar.gz
```

This creates a directory with a name of the form `wfdb-10.m.n`.

- Enter this directory, configure, and install the package:

```
○ cd wfdb-10.m.n
○ ./configure
○ make install
```

The `make` command requires root permissions, and installs the package in subdirectories of `/usr`. If you do not have root permissions, you may install the package in any writable directory by adding an appropriate option to the `make` command above:

```
make install WFDBROOT=/path/to/another/directory
```

Note that in this case you will need to add `WFDBROOT/bin` to your `PATH`, and `WFDBROOT/lib` to your `LD_LIBRARY_PATH`.

- (Optional) Check that the WFDB library and applications have been correctly compiled and installed:

```
○ make check
```

This step compiles a short program that exercises the WFDB library and applications, and prints a summary of test results. The tests are very short (typically less than a second each), except that the last one (xform using NETFILES) may take up to a minute if you have a slow or inoperative Internet connection. If any application test fails, its output (*program.out*) can be found in the `checkpkg` subdirectory of the WFDB source tree; compare this output with the file of the same name that can be found in the `checkpkg/expected` subdirectory.

- **If you are running a 64-bit version of Linux, install WAVE now** (optional, requires root permissions). WAVE must be compiled in 32-bit mode, because it requires XView libraries that do not support 64-bit mode. On 64-bit Fedora, simply run the installer:

```
○ ./install-wave32
```

The installer will download and install 32-bit XView and other compatibility libraries, and compile and install a 32-bit version of the WFDB library, before compiling and installing WAVE itself.

If you are not using Fedora, the names of the required 32-bit compatibility libraries may differ; read and modify the `install-wave32` script as necessary for your distribution before running it.

- **If WAVE was installed, test it** with the command:

```
○ wave -r mitdb/200 -a atr
```

If you have not used WAVE before, you may want to follow through the tutorial material in the beginning of the [WAVE User's Guide](#).

If you download the binaries (not recommended):

- If you have the RPM utility, and have installed libcurl and XView, download the binary WFDB RPMs for your distribution from the [directory of Linux binaries](#), and install them:

```
○ rpm -Uvh wfdb*rpm  
○ /sbin/ldconfig
```

- Otherwise, look for `wfdb-10.m.n` in the [directory of Linux binaries](#). Within `wfdb-10.m.n` you will find `bin` and `lib` directories. Copy the files from the `lib` directory into one of the directories named in `/etc/ld.so.conf` (`/usr/lib` is recommended) and run `/sbin/ldconfig` (requires root permissions). Next, copy the applications from the `bin` directory into any directory in your `PATH`.

7. **Read the manuals.** Really! :-) If you want to write your own software to work with PhysioBank data, begin with the [WFDB Programmer's Guide](#). To learn about the wide variety of existing software that can be used to study PhysioBank data, read the [WFDB Applications Guide](#) and the [WAVE User's Guide](#).

COMPILING A 32-BIT WFDB LIBRARY ON 64-BIT LINUX

You might need to do this in order to compile other software that uses the WFDB library and that must be compiled into a 32-bit executable, such as [ecgpuwave](#).

If you have run `./install-wave32` successfully as described above, you have installed a 32-bit WFDB library already. Otherwise, install a 32-bit `libcurl` or `libwww` library if possible, then run these commands (root permissions will be required for the last one):

```
make clean
./configure -m32
cd lib
make install
```

NOTES:

Most parts of software packages listed in <http://www.physionet.org/physiotools/software-index.shtml> are installed successfully according the above installation guide. Especially for PhysioBank, Physiologic signal processing and General signal processing. Some of software in the website lists is just source codes, so it does not need to install. If you want to use it, just download it and use it.

FAQ:

1. `xmlproc.h:31:19: fatal error: expat.h: No such file or directory`
compilation terminated.
`make[1]: *** [xmlann] Error 1`

Solution: Download [expat-devel](#) from the website:
<http://rpmfind.net/linux/rpm2html/search.php?query=expat-devel>

Then install it with this commands:

```
rpm -ivh expat-devel-2.0.1-11.fc15.i686.rpm
```

2. Another problem is caused by missing **HTTP client library**. Using the commands `'curl-config --version'` and `'libwww-config --version'` to check whether HTTP client library exists or not. If neither [libcurl](#) nor [libwww](#) has been installed already, using the commands in step 4 to install it.

3. PhysioNet needs [XView](#). Make sure `xview`, `xview-clients` and `xview-devel`

packages are all installed. You can download XView according to your OS type from the website: <http://www.physionet.org/physiotools/xview/>

REFERENCE:

1. Goldberger AL, Amaral LAN, Glass L, Hausdorff JM, Ivanov PCh, Mark RG, Mietus JE, Moody GB, Peng C-K, Stanley HE. PhysioBank, PhysioToolkit, and PhysioNet: Components of a New Research Resource for Complex Physiologic Signals. *Circulation* 101(23):e215-e220 [Circulation Electronic Pages; <http://circ.ahajournals.org/cgi/content/full/101/23/e215>]; 2000 (June 13).
2. PhysioNet website: <http://www.physionet.org/>