

# root5

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## 1 User Install

### 1.1 Install in a PRoot

PRoot is like a light-weight, user-level `chroot`. It is a native system package on my OS:

```
$ sudo apt-get install proot
```

Following PRoot-based installation a Nix installation is prepared like:

```
$ mkdir -p /path/to/mystuff
$ cd /path/to/mystuff
$ wget http://hydra.nixos.org/build/23017494/download/1/nix-1.9-x86_64-linux.tar.bz2
$ tar -xvf nix-1.9-x86_64-linux.tar.bz2
$ proot -b 'pwd' /nix-1.9-x86_64-linux/:/nix bash
$ cd /nix
$ ls
install  store
$ ./install
```

```
$ source $HOME/.nix-profile/etc/profile.d/nix.sh
```

```
$ du -sh store
309M    store
$ nix-env -qa |wc -l
11624
```

## 1.2 Native install

As light-weight as PRoot is, there is apparently some run-time overhead. From inside the environment it provides it is possible to build Nix packages that can run native and out of a different *package store* root than the conventional `/nix`.

Pick the directory wisely as it gets baked in to all the building that comes next.

```
$ nix-channel --update
$ mkdir -p /path/to/nix
$ NIX_STORE_DIR=/path/to/nix nix-env -i nix
```

## 1.3 Developing

[https://nixos.org/wiki/Create\\_and\\_debug\\_nix\\_packages](https://nixos.org/wiki/Create_and_debug_nix_packages)

```
$ git clone https://github.com/NixOS/nixpkgs.git
$ export NIXPKGS='pwd'/nixpkgs
```

## 2 Build ROOT

The goal here is to build ROOT6 as a Nix package. Someone has already packaged ROOT5, let's try that first:

```
$ nix-env -qa root
root-5.34.15
$ nix-env -i root
installing 'root-5.34.15'
...
Linking CXX shared library ../../lib/libRGL.so
CMakeFiles/RGL.dir/src/TX11GL.cxx.o: In function 'TX11GLManager::ReadGLBuffer(int)':
TX11GL.cxx:(.text+0x1b4): undefined reference to 'XPutImage'
TX11GL.cxx:(.text+0x21c): undefined reference to 'XCreateGC'
```

```

CMakeFiles/RGL.dir/src/TX11GL.cxx.o: In function 'TX11GLManager::Flush(int)':
TX11GL.cxx:(.text+0x6ae): undefined reference to 'XCopyArea'
TX11GL.cxx:(.text+0x731): undefined reference to 'XCreateGC'
CMakeFiles/RGL.dir/src/TX11GL.cxx.o: In function 'TX11GLManager::DeleteGLContext(int)':
TX11GL.cxx:(.text+0x835): undefined reference to 'XFreeGC'
TX11GL.cxx:(.text+0x856): undefined reference to 'XFreeGC'
CMakeFiles/RGL.dir/src/TX11GL.cxx.o: In function 'TX11GLManager::InitGLWindow(unsigned
TX11GL.cxx:(.text+0x11a2): undefined reference to 'XGetGeometry'
TX11GL.cxx:(.text+0x1287): undefined reference to 'XCreateColormap'
TX11GL.cxx:(.text+0x12e9): undefined reference to 'XCreateWindow'
TX11GL.cxx:(.text+0x1303): undefined reference to 'XMapWindow'
CMakeFiles/RGL.dir/src/TX11GL.cxx.o: In function 'TX11GLManager::CreateGLPixmap(TX11GL
TX11GL.cxx:(.text+0x14d3): undefined reference to 'XCreatePixmap'
TX11GL.cxx:(.text+0x1561): undefined reference to 'XCreateImage'
TX11GL.cxx:(.text+0x1596): undefined reference to 'XInitImage'
TX11GL.cxx:(.text+0x178f): undefined reference to 'XFreePixmap'
TX11GL.cxx:(.text+0x181b): undefined reference to 'XFreePixmap'
CMakeFiles/RGL.dir/src/TGLWidget.cxx.o: In function 'TGLWidget::CreateWindow(TGWindow
TGLWidget.cxx:(.text+0x9b3): undefined reference to 'XCreateColormap'
TGLWidget.cxx:(.text+0xa08): undefined reference to 'XCreateWindow'
CMakeFiles/RGL.dir/src/TGLWidget.cxx.o: In function 'TGLWidget::~TGLWidget()':
TGLWidget.cxx:(.text+0x1665): undefined reference to 'XFree'
CMakeFiles/RGL.dir/src/TGLFormat.cxx.o: In function 'TGLFormat::InitAvailableSamples()
TGLFormat.cxx:(.text+0x40a): undefined reference to 'XGetVisualInfo'
TGLFormat.cxx:(.text+0x485): undefined reference to 'XFree'
collect2: error: ld returned 1 exit status
graf3d/gl/CMakeFiles/RGL.dir/build.make:2445: recipe for target 'lib/libRGL.so' failed
make[2]: *** [lib/libRGL.so] Error 1
CMakeFiles/Makefile2:7032: recipe for target 'graf3d/gl/CMakeFiles/RGL.dir/all' failed
make[1]: *** [graf3d/gl/CMakeFiles/RGL.dir/all] Error 2
make[1]: *** Waiting for unfinished jobs....
Linking CXX shared library ../lib/libTMVA.so
[ 92%] Built target TMVA
Makefile:136: recipe for target 'all' failed
make: *** [all] Error 2
builder for '/nix/store/l88wsvpbjr3lrz7pzfc3b0mj6hhrg25j-root-5.34.15.drv' failed with
error: build of '/nix/store/l88wsvpbjr3lrz7pzfc3b0mj6hhrg25j-root-5.34.15.drv' failed

```

Seems that the ROOT package doesn't depend on X11 libs.  
Let's get the latest from nixpkgs

From inside the PRoot

```
$ cd /nix
$ git clone https://github.com/NixOS/nixpkgs.git
$ export NIXPKGS=/nix/nixpkgs
$ nix-env -f $NIXPKGS -qa root
root-5.34.15
...
```

## 2.1 Debug the build

```
$ proot -b /srv/nix/nix-1.9-x86_64-linux/:/nix bash -l
$ source $HOME/.nix-profile/etc/profile.d/nix.sh
$ nix-shell /nix/nixpkgs --pure -A root
$ genericBuild
```

When that `genericBuild` fails it kicks you out of the shell. The individual steps are

```
$ unpackPhase
$ cd root
$ patchPhase
$ cmakeConfigurePhase # leaves you in root/build/
$ buildPhase
```