

Using *zlibbioc*

Martin Morgan

Modified: 29 September, 2011. Compiled: April 26, 2022

The *zlibbioc* package is meant as a utility for package developers. It contains the source code to the `zlib` library, and can be used to access `zlib` shared library functionality. The library is made available as `libzbioc`.

The *zlibbioc* package is installed in the normal R manner. The `libzbioc` library is always built on Windows, but on other platforms it is only built when provided with the configure option `--with-libzbioc`, e.g., as

```
R CMD INSTALL --configure-args="--with-libzbioc" zlibbioc_<...>.tar.gz
```

or

```
> install.packages("zlibbioc_<...>.tar.gz",  
                  configure.args="--with-libzbioc")
```

MacOS has `zlib` installed, so building the libraries are neither necessary nor supported on that platform. Advanced use cases may require consultation of instructions in `zlibbioc/src/zlib-1.2.5/configure`.

All packages wishing to use the libraries in *zlibbioc* must

- Add `Imports: zlibbioc` to the `DESCRIPTION` file.
- Add `import(zlibbioc)` to the `NAMESPACE` file.

Reference the relevant include file in your C source code:

```
#include "zlib.h"
```

The content of the include files can be found in the *zlibbioc* source (under `src/zlib-1.2.5`) or at their installed location.

On Windows, the recommended approach is to link to the DLL. This requires that the appropriate header files are available to the `gcc` compiler, and that the DLL is discovered by the linker.

- Create a file `src/Makevars.win` including the following lines:

```
ZLIB_CFLAGS+=$(shell echo 'zlibbioc::pkgconfig("PKG_CFLAGS")' | \  
  "${R_HOME}/bin/R" --vanilla --slave)  
PKG_LIBS+=$(shell echo 'zlibbioc::pkgconfig("PKG_LIBS_shared")' | \  
  "${R_HOME}/bin/R" --vanilla --slave)  
%.o: %.c  
  $(CC) $(ZLIB_CFLAGS) $(ALL_CPPFLAGS) $(ALL_CFLAGS) -c $< -o $@
```

Packages with C++ code also require the rule (replace `.cc` with `.cpp` as necessary)

```
% .o: %.cc
    $(CXX) $(ZLIB_CFLAGS) $(ALL_CPPFLAGS) $(ALL_CXXFLAGS) -c $< -o $@
```

(remember that the second line of each rule begins with a tab, not spaces).

On Linux and other platforms, the most portable solution is to link to static libraries

- Create a file `src/Makevars` including the following lines:

```
PKG_CFLAGS+=$(shell echo 'zlibbioc::pkgconfig("PKG_CFLAGS")' |\
    "${R_HOME}/bin/R" --vanilla --slave)
PKG_LIBS+=$(shell echo 'zlibbioc::pkgconfig("PKG_LIBS_static")' |\
    "${R_HOME}/bin/R" --vanilla --slave)
```

It is also possible to link to the shared library (see qualifications about portability in ‘Writing R Extensions’) with

```
PKG_CFLAGS+=$(shell echo 'zlibbioc::pkgconfig("PKG_CFLAGS")' |\
    "${R_HOME}/bin/R" --vanilla --slave)
PKG_LIBS+=$(shell echo 'zlibbioc::pkgconfig("PKG_LIBS_shared")' |\
    "${R_HOME}/bin/R" --vanilla --slave)
```

The *Rsamtools* package is a more complex example illustrating this approach.