Changes in R

From version 3.1.3 to version 3.2.1

by the R Core Team

CHANGES IN R 3.2.1

NEW FEATURES

- `utf8ToInt()` now checks that its input is valid UTF-8 and returns `NA` if it is not.
- `install.packages()` now allows `type = "both"` with `repos = NULL` if it can infer the type of file.
- `nchar(x,*)` and `nzchar(x)` gain a new argument `keepNA` which governs how the result for `NA`s in `x` is determined. For the R 3.2.x series, the default remains `FALSE` which is fully back compatible. From R 3.3.0, the default will change to `keepNA = NA` and you are advised to consider this for code portability.
- `news()` more flexibly extracts dates from package 'NEWS.Rd' files.
- `lengths(x)` now also works (trivially) for atomic `x` and hence can be used more generally as an efficient replacement of `sapply(x,length)` and similar.
- The included version of PCRE has been updated to 8.37, a bug-fix release.
- `diag()` no longer duplicates a matrix when extracting its diagonal.
- `as.character.srcref()` gains an argument to allow characters corresponding to a range of source references to be extracted.

BUG FIXES

- `acf()` and `ccf()` now guarantee values strictly in $[-1, 1]$ (instead of sometimes very slightly outside). PR#15832.
- `as.integer("11111111111")` now gives NA (with a warning) as it does for the corresponding numeric or negative number coercions. Further, `as.integer(M + 0.1)` now gives `M` (instead of NA) when M is the maximal representable integer.
- On some platforms `nchar(x,"c")` and `nchar(x,"w")` would return values (possibly `NA`) for inputs which were declared to be UTF-8 but were not, or for invalid strings without a marked encoding in a multi-byte locale, rather than give an error. Additional checks have been added to mitigate this.
- `apply(a,M,function(u) c(X = .,Y = .))` again has dimnames containing "X" and "Y" (as in R < 3.2.0).
- (Windows only) In some cases, the `--clean` option to `R CMD INSTALL` could fail. (PR#16178)
- (Windows only) `choose.files()` would occasionally include characters from the result of an earlier call in the result of a later one. (PR#16270)
- A change in `RSiteSearch()` in R 3.2.0 caused it to submit invalid URLs. (PR#16329)
- `Rscript` and command line `R` silently ignored incomplete statements at the end of a script; now they are reported as parse errors. (PR#16350)
- Parse data for very long strings was not stored. (PR#16354)

- `plotNode()`, the workhorse of the `plot` method for `"dendrogram"`s is no longer recursive, thanks to Suharto Anggono, and hence also works for deeply nested dendrograms. (PR#15215)
- The parser could overflow internally when given numbers in scientific format with extremely large exponents. (PR#16358)
- If the CRAN mirror was not set, `install.packages(type = "both")` and related functions could repeatedly query the user for it. (Part of PR#16362)
- The low-level functions `.rowSums()` etc. did not check the length of their argument, so could segfault. (PR#16367)
- The `quietly` argument of `library()` is now correctly propagated from `.getRequiredPackages2()`.
- Under some circumstances using the internal PCRE when building R fron source would cause external libs such as `-llzma` to be omitted from the main link.
- The .Primitive default methods of the logic operators, i.e., `!`, `&` and `|`, now give correct error messages when appropriate, e.g., for `` `&`(TRUE) `` or `` `!`() ``. (PR#16385)
- `cummax(x)` now correctly propagates `NA`s also when `x` is of type `integer` and begins with an `NA`.
- `summaryRprof()` could fail when the profile contained only two records. (PR#16395)
- HTML vignettes opened using `vignette()` did not support links into the rest of the HTML help system. (Links worked properly when the vignette was opened using `browseVignettes()` or from within the help system.)
- `arima(*,xreg = .)` (for $d \geq 1$) computes estimated variances based on a the number of effective observations as in R version 3.0.1 and earlier. (PR#16278)
- `slotNames(.)` is now correct for `"signature"` objects (mostly used internally in **methods**).
- On some systems, the first string comparison after a locale change would result in `NA`.

CHANGES IN R 3.2.0

NEW FEATURES

- `anyNA()` gains a `recursive` argument.
- When `x` is missing and `names` is not false (including the default value), `Sys.getenv(x,names)` returns an object of class `"Dlist"` and hence prints tidily.
- (Windows.) `shell()` no longer consults the environment variable `SHELL`: too many systems have been encountered where it was set incorrectly (usually to a path where software was compiled, not where it was installed). `R_SHELL`, the preferred way to select a non-default shell, can be used instead.
- Some unusual arguments to `embedFonts()` can now be specified as character vectors, and the defaults have been changed accordingly.
- Functions in the `Summary` group duplicate less. (PR#15798)
- (Unix-alikes.) `system(cmd,input = )` now uses 'shell-execution-environment' redirection, which will be more natural if `cmd` is not a single command (but requires a POSIX-compliant shell). (Wish of PR#15508)
- `read.fwf()` and `read.DIF()` gain a `fileEncoding` argument, for convenience.

- Graphics devices can add attributes to their description in `.Device` and `.Devices`. Several of those included with R use a `"filepath"` attribute.
- `pmatch()` uses hashing in more cases and so is faster at the expense of using more memory. (PR#15697)
- `pairs()` gains new arguments to select sets of variables to be plotted against each other.
- `file.info(,extra_cols = FALSE)` allows a minimal set of columns to be computed on Unix-alikes: on some systems without properly-configured caching this can be significantly faster with large file lists.
- New function `dir.exists()` in package **base** to test efficiently whether one or more paths exist and are directories.
- `dput()` and friends gain new controls 'hexNumeric' and 'digits17' which output double and complex quantities as, respectively, binary fractions (exactly, see `sprintf("%a")`) and as decimals with up to 17 significant digits.
- `save()`, `saveRDS()` and `serialize()` now support `ascii = NA` which writes ASCII files using `sprintf("%a")` for double/complex quantities. This is read-compatible with `ascii = TRUE` but avoids binary->decimal->binary conversions with potential loss of precision. Unfortunately the Windows C runtime's lack of C99 compliance means that the format cannot be read correctly there in R before 3.1.2.
- The default for `formatC(decimal.mark =)` has been changed to be `getOption("OutDec")`; this makes it more consistent with `format()` and suitable for use in print methods, e.g. those for classes `"density"`, `"ecdf"`, `"stepfun"` and `"summary.lm"`.

  `getOption("OutDec")` is now consulted by the print method for class `"kmeans"`, by `cut()`, `dendrogram()`, `plot.ts()` and `quantile()` when constructing labels and for the report from `legend(trace = TRUE)`.

  (In part, wish of PR#15819.)
- `printNum()` and hence `format()` and `formatC()` give a warning if `big.mark` and `decimal.mark` are set to the same value (period and comma are not uncommonly used for each, and this is a check that conventions have not got mixed).
- `merge()` can create a result which uses long vectors on 64-bit platforms.
- `dget()` gains a new argument `keep.source` which defaults to `FALSE` for speed (`dput()` and `dget()` are most often used for data objects where this can make `dget()` many times faster).
- Packages may now use a file of common macro definitions in their help files, and may import definitions from other packages.
- A number of macros have been added in the new 'share/Rd' directory for use in package overview help pages, and `promptPackage()` now makes use of them.
- `tools::parse_Rd()` gains a new `permissive` argument which converts unrecognized macros into text. This is used by `utils:::format.bibentry` to allow LaTeX markup to be ignored.
- `options(OutDec =)` can now specify a multi-byte character, e.g., `options(OutDec = "\u00b7")` in a UTF-8 locale.
- `is.recursive(x)` is no longer true when `x` is an external pointer, a weak reference or byte code; the first enables `all.equal(x,x)` when `x <-getClass(.)`.
- `ls()` (aka `objects()`) and `as.list.environment()` gain a new argument `sorted`.

- The `"source"` attribute (which has not been added to functions by R since before R version 2.14.0) is no longer treated as special.
- Function `returnValue()` has been added to give `on.exit()` code access to a function's return value for debugging purposes.
- `crossprod(x,y)` allows more matrix coercions when `x` or `y` are vectors, now equalling `t(x) %*% y` in these cases (also reported by Radford Neal). Similarly, `tcrossprod(x,y)` and `%*%` work in more cases with vector arguments.
- Utility function `dynGet()` useful for detecting cycles, aka infinite recursions.
- The byte-code compiler and interpreter include new instructions that allow many scalar subsetting and assignment and scalar arithmetic operations to be handled more efficiently. This can result in significant performance improvements in scalar numerical code.
- `apply(m,2,identity)` is now the same as the matrix `m` when it has *named* row names.
- A new function `debuggingState()` has been added, allowing to temporarily turn off debugging.
- `example()` gets a new optional argument `run.donttest` and `tools::Rd2ex()` a corresponding `commentDonttest`, with a default such that `example(..)` in help examples will run `\donttest` code only if used interactively (a change in behaviour).
- `rbind.data.frame()` gains an optional argument `make.row.names`, for potential speedup.
- New function `extSoftVersion()` to report on the versions of third-party software in use in this session. Currently reports versions of `zlib`, `bzlib`, the `liblzma` from `xz`, PCRE, ICU, TRE and the `iconv` implementation.

  A similar function `grSoftVersion()` in package **grDevices** reports on third-party graphics software.

  Function `tcltk::tclVersion()` reports the Tcl/Tk version.
- Calling `callGeneric()` without arguments now works with primitive generics to some extent.
- `vapply(x,FUN,FUN.VALUE)` is more efficient notably for large `length(FUN.VALUE)`; as extension of PR#16061.
- `as.table()` now allows tables with one or more dimensions of length 0 (such as `as.table(integer())`).
- `names(x) <-NULL` now clears the names of call and `...` objects.
- `library()` will report a warning when an insufficient dependency version is masking a sufficient one later on the library search path.
- A new `plot()` method for class `"raster"` has been added.
- New `check_packages_in_dir_changes()` function in package **tools** for conveniently analyzing how changing sources impacts the check results of their reverse dependencies.
- Speed-up from Peter Haverty for `ls()` and `methods:::.requirePackage()` speeding up package loading. (PR#16133)
- New `get0()` function, combining `exists()` and `get()` in one call, for efficiency.
- `match.call()` gains an `envir` argument for specifying the environment from which to retrieve the `...` in the call, if any; this environment was wrong (or at least undesirable) when the `definition` argument was a function.

- `topenv()` has been made `.Internal()` for speedup, based on Peter Haverty's proposal in PR#16140.
- `getOption()` no longer calls `options()` in the main case.
- Optional use of `libcurl` (version 7.28.0 from Oct 2012 or later) for Internet access:
  - `capabilities("libcurl")` reports if this is available.
  - `libcurlVersion()` reports the version in use, and other details of the `"libcurl"` build including which URL schemes it supports.
  - `curlGetHeaders()` retrieves the headers for `http://`, `https://`, `ftp://` and `ftps://` URLs: analysis of these headers can provide insights into the 'existence' of a URL (it might for example be permanently redirected) and is so used in `R CMD check --as-cran`.
  - `download.file()` has a new optional method `"libcurl"` which will handle more URL schemes, follow redirections, and allows simultaneous downloads of multiple URLs.
  - `url()` has a new method `"libcurl"` which handles more URL schemes and follows redirections. The default method is controlled by a new option `url.method`, which applies also to the opening of URLs *via* `file()` (which happens implicitly in functions such as `read.table`.)
  - When `file()` or `url()` is invoked with a `https://` or `ftps://` URL which the current method cannot handle, it switches to a suitable method if one is available.
- (Windows.) The DLLs 'internet.dll' and 'internet2.dll' have been merged. In this version it is safe to switch (repeatedly) between the internal and Windows internet functions within an R session.

  The Windows internet functions are still selected by flag '`--internet2`' or `setInternet2()`. This can be overridden for an `url()` connection *via* its new `method` argument.

  `download.file()` has new method `"wininet"`, selected as the default by '`--internet2`' or `setInternet2()`.
- `parent.env<-` can no longer modify the parent of a locked namespace or namespace imports environment. Contributed by Karl Millar.
- New function `isNamespaceLoaded()` for readability and speed.
- `names(env)` now returns all the object names of an `environment` `env`, equivalently to `ls(env,all.names = TRUE,sorted = FALSE)` and also to the names of the corresponding list, `names(as.list(env,all.names = TRUE))`. Note that although `names()` returns a character vector, the names have no particular ordering.
- The memory manager now grows the heap more aggressively. This reduces the number of garbage collections, in particular while data or code are loaded, at the expense of slightly increasing the memory footprint.
- New function `trimws()` for removing leading/trailing whitespace.
- `cbind()` and `rbind()` now consider S4 inheritance during S3 dispatch and also obey `deparse.level`.
- `cbind()` and `rbind()` will delegate recursively to `methods::cbind2` (`methods::rbind2`) when at least one argument is an S4 object and S3 dispatch fails (due to ambiguity).
- (Windows.) `download.file(quiet = FALSE)` now uses text rather than Windows progress bars in non-interactive use.

- New function `hsearch_db()` in package **utils** for building and retrieving the help search database used by `help.search()`, along with functions for inspecting the concepts and keywords in the help search database.
- New function `.getNamespaceInfo()`, a no-check version of `getNamespaceInfo()` mostly for internal speedups.
- The help search system now takes '`\keyword`' entries in Rd files which are not standard keywords (as given in 'KEYWORDS' in the R documentation directory) as concepts. For standard keyword entries the corresponding descriptions are additionally taken as concepts.
- New `lengths()` function for getting the lengths of all elements in a list.
- New function `toTitleCase()` in package **tools**, tailored to package titles.
- The matrix methods of `cbind()` and `rbind()` allow matrices as inputs which have 2^{31} or more elements. (For `cbind()`, wish of PR#16198.)
- The default method of `image()` has an explicit check for a numeric or logical matrix (which was always required).
- `URLencode()` will not by default encode further URLs which appear to be already encoded.
- `BIC(mod)` and `BIC(mod,mod2)` now give non-NA numbers for `arima()` fitted models, as `nobs(mod)` now gives the number of "used" observations for such models. This fixes PR#16198, quite differently than proposed there.
- The `print()` methods for `"htest"`, `"pairwise.htest"` and `"power.htest"` objects now have a `digits` argument defaulting to (a function of) `getOption("digits")`, and influencing all printed numbers coherently. Unavoidably, this changes the display of such test results in some cases.
- Code completion for namespaces now recognizes all loaded namespaces, rather than only the ones that are also attached.
- The code completion mechanism can now be replaced by a user-specified completer function, for (temporary) situations where the usual code completion is inappropriate.
- `unzip()` will now warn if it is able to detect truncation when unpacking a file of 4GB or more (related to PR#16243).
- `methods()` reports S4 in addition to S3 methods; output is simplified when the `class` argument is used. `.S3methods()` and `methods:::.S4methods()` report S3 and S4 methods separately.
- Higher order functions such as the `apply` functions and `Reduce()` now force arguments to the functions they apply in order to eliminate undesirable interactions between lazy evaluation and variable capture in closures. This resolves PR#16093.

INSTALLATION and INCLUDED SOFTWARE

- The `\donttest` sections of R's help files can be tested by `make check TEST_DONTTEST=TRUE`.
- It is possible to request the use of system `valgrind` headers *via* `configure` option '`--with-system-valgrind-headers`': note the possible future incompatibility of such headers discussed in the 'R Installation and Administration' manual. (Wish of PR#16068.)
- The included version of `liblzma` has been updated to `xz-utils` 5.0.7 (minor bug fixes from 5.0.5).

- `configure` options '`--with-system-zlib`', '`--with-system-bzlib`' and '`--with-system-pcre`' are now the default. For the time being there is fallback to the versions included in the R sources if no system versions are found or (unlikely) if they are too old.

  Linux users should check that the `-devel` or `-dev` versions of packages **zlib**, **bzip2**/**libbz2** and **pcre** as well as **xz-devel**/**liblzma-dev** (or similar names) are installed.

- `configure` by default looks for the `texi2any` script from **texinfo** 5.1 or later, rather than the `makeinfo` program. (`makeinfo` is a link to the Perl script `texi2any` in **texinfo** 5.x.)

- `R CMD INSTALL` gains an option '`--built-timestamp=STAMP`' allowing 100% reproducible package building, thanks to Dirk Eddelbuettel.

UTILITIES

- There is support for testing the `\dontrun` and `\donttest` parts of examples in packages.

  `tools::testInstalledPackage()` accepts new arguments `commentDontrun = FALSE` and `commentDonttest = FALSE`.

  `R CMD check` gains options '`--run-dontrun`' and '`--run-donttest`'.

- The HTML generated by `tools::Rd2HTML()` and `tools::toHTML()` methods is now 'XHTML 1.0 Strict'.

- The **compiler** package's utility function `setCompilerOptions()` now returns the old values invisibly. The initial optimization level can also be set with the environment variable `R_COMPILER_OPTIMIZE`.

- `R CMD build` adds a '`NeedsCompilation`' field if one is not already present in the 'DESCRIPTION' file.

- `R CMD check` gains option '`--test-dir`' to specify an alternative set of tests to run.

- `R CMD check` will now by default continue with testing after many types of errors, and will output a summary count of errors at the end if any have occurred.

- `R CMD check` now checks that the '`Title`' and '`Description`' fields are correctly terminated.

- `R CMD check --as-cran` now:

  - checks a 'README.md' file can be processed: this needs `pandoc` installed.
  - checks the existence and accessibility of URLs in the 'DESCRIPTION', 'CITATION', 'NEWS.Rd' and 'README.md' files and in the help files (provided the build has `libcurl` support).
  - reports non-ASCII characters in R source files when there is no package encoding declared in the 'DESCRIPTION' file.
  - reports (apparent) S3 methods exported but not registered.
  - reports overwriting registered S3 methods from base/recommended packages. (Such methods are replaced in the affected package for the rest of the session, even if the replacing namespace is unloaded.)
  - reports if the `Title` field does not appear to be in title case (see 'Writing R Extensions': there may be false positives, but note that technical words should be single-quoted and will then be accepted).

  Most of these checks can also be selected by environment variables: see the 'R Internals' manual.

C-LEVEL FACILITIES

- New C API utility `logspace_sum(logx[],n)`.
- Entry points `rbinom_mu`, `rnbinom_mu` and `rmultinom` are remapped (by default) to `Rf_rbinom_mu` etc. This requires packages using them to be re-installed.
- `.C(DUP = FALSE)` and `.Fortran(DUP = FALSE)` are now ignored, so arguments are duplicated if `DUP = TRUE` would do so. As their help has long said, `.Call()` is much preferred.
- New entry point `R_allocLD`, like `R_alloc` but guaranteed to have sufficient alignment for `long double` pointers.
- `isPairList()` now returns `TRUE` for DOTSXP.

WINDOWS BUILD CHANGES

A number of changes to the Windows build system are in development. The following are currently in place.

- Installation using external binary distributions of **zlib**, **bzip2**, **liblzma**, **pcre**, **libpng**, **jpeglib** and **libtiff** is now required, and the build instructions have been revised.
- A new `make` target `rsync-extsoft` has been added to obtain copies of the external libraries from CRAN.
- Building the manuals now requires `texi2any` from **texinfo** 5.1 or later. CRAN binary builds include the manuals, but by default builds from source will not, and they will be accessed from CRAN. See the comments in 'src/gnuwin32/MkRules.dist' for how to specify the location of `texi2any`.
- (Windows) Changes have been made to support an experimental Windows toolchain based on GCC 4.9.2. The default toolchain continues to be based on GCC 4.6.3, as the new toolchain is not yet stable enough. A change to a new toolchain is expected during the R 3.2.x lifetime.

PACKAGE INSTALLATION

- (Windows) The use of macro `ZLIB_LIBS` in file 'src/Makevars.win' (which has not been documented for a long time) now requires an external 'libz.a' to be available (it is part of the 'goodies' used to compile Windows binary packages). It would be simpler to use `-lz` instead.
- The default for option `pkgType` on platforms using binary packages is now `"both"`, so source packages will be tried if binary versions are not available or not up to date.

  There are options for what `install.packages(type = "both")` (possibly called *via* `update.packages()`) will do if compilation of a source package is desirable: see `?options` (under **utils**).

  If you intend not to accept updates as source packages, you should use `update.packages(type = "binary")`.

DEPRECATED AND DEFUNCT

- `download.file(method = "lynx")` is defunct.
- Building R using the included versions of `zlib`, `bzip2`, `xz` and PCRE is deprecated: these are frozen (bar essential bug-fixes) and will be removed for R 3.3.0.

- The `configure` option '`--with-valgrind-instrumentation=3`' has been withdrawn, as it did not work with recent `valgrind` headers: it is now treated as level `2`.
- The `MethodsList` class in package **methods** had been deprecated in R 2.11.0 and is defunct now. Functions using it are defunct if they had been deprecated in R 2.11.0, and are deprecated now, otherwise.

BUG FIXES

- Fixed two obscure bugs in pairlist subassignment, reported by Radford Neal as part of pqR issue 16.
- Fixes for bugs in handling empty arguments and argument matching by name in `log()`.
- `all.equal()` gains methods for `environments` and `refClasses`.
- `[<-` and `[[<-` gain S4 `data.frame` methods to avoid corruption of S4 class information by the S3 methods.
- `callNextMethod()` should now work within a `.local` call when `...` is absent from `formals(.local)`.
- `dput(pairlist(x))` generates a call to the `pairlist` constructor instead of the `list` constructor.
- Fix `missing()` when arguments are propagated through `...` . (PR#15707)
- `eigen(m)` now defaults to `symmetric = TRUE` even when the dimnames are asymmetric if the matrix is otherwise symmetric. (PR#16151)
- Fix issues with forwarding `...` through `callGeneric()` and `callNextMethod()`. (PR#16141)
- `callGeneric()` now works after a `callNextMethod()`.
- Subclass information is kept consistent when replacing an ordinary S4 class with an "old class" *via* the `S4Class` argument to `setOldClass()`. Thus, for example, a `data.frame` is valid for a `list` argument in the signature, and a `factor` is valid for `vector` arguments.
- In `qbeta()` the inversion of `pbeta()` is much more sophisticated. This works better in corner cases some of which failed completely previously (PR#15755), or were using too many iterations.
- Auto-printing no longer duplicates objects when printing is dispatched to a method.
- `kmeans(x,k)` would fail when `nrow(x) >= 42949673`. (Comment 6 of PR#15364)
- 'Abbreviated' locale-specific day and month names could have been truncated in those rare locales where there are the same as the full names.
- An irrelevant warning message from updating subclass information was silenced (the namespace would not be writable in this case).

CHANGES IN R 3.1.3

NEW FEATURES

- The internal method of `download.file()` can now handle files larger than 2GB on 32-bit builds which support such files (tested on 32-bit R running on 64-bit Windows).

- `kruskal.test()` warns on more types of suspicious input.
- The `as.dendrogram()` method for `"hclust"` objects gains a `check` argument protecting against memory explosion for invalid inputs.
- `capabilities()` has a new item `long.double` which indicates if the build uses a `long double` type which is longer than `double`.
- `nlm()` no longer modifies the callback argument in place (a new vector is allocated for each invocation, which mimics the implicit duplication that occurred in R < 3.1.0); note that this is a change from the previously documented behavior. (PR#15958)
- `icuSetCollate()` now accepts `locale = "ASCII"` which uses the basic C function `strcmp` and so collates strings byte-by-byte in numerical order.
- `sessionInfo()` tries to report the OS version in use (not just that compiled under, and including details of Linux distributions).
- `model.frame()` (used by `lm()` and many other modelling functions) now warns when it drops contrasts from factors. (Wish of PR#16119)
- `install.packages()` and friends now accept the value `type = "binary"` as a synonym for the native binary type on the platform (if it has one).
- Single source or binary files can be supplied for `install.packages(type = "both")` and the appropriate type and `repos = NULL` will be inferred.
- New function `pcre_config()` to report on some of the configuration options of the version of PCRE in use. In particular, this reports if regular expressions using '`\p{xx}`' are supported.
- (Windows.) `download.file(cacheOK = FALSE)` is now supported when 'internet2.dll' is used.
- `browseURL()` has been updated to work with Firefox 36.0 which has dropped support for the '`-remote`' interface.

INSTALLATION and INCLUDED SOFTWARE

- The included version of PCRE has been updated to 8.36.
- `configure` accepts '`MAKEINFO=texi2any`' as another way to ensure **texinfo** 5.x is used when both 5.x and 4.x are installed.

UTILITIES

- `R CMD check` now checks the packages used in `\donttest` sections of the examples are specified in the 'DESCRIPTION' file. (These are needed to run the examples interactively.)
- `R CMD check` checks for the undeclared use of GNU extensions in Makefiles, and for Makefiles with a missing final linefeed.

  `R CMD build` will correct line endings in all Makefiles, not just those in the 'src' directory.
- `R CMD check` notes uses of `library()` and `require()` in package code: see the section 'Suggested packages' of 'Writing R Extensions' for good practice.

DEPRECATED AND DEFUNCT

- The `configure` option '`--with-valgrind-instrumentation=3`' is deprecated and will be removed in R 3.2.0.

BUG FIXES

- (Windows.) `Rscript.exe` was missing a manifest specifying the modern style for common controls (e.g., the download progress bar).
- If a package had extra documentation files but no vignette, the HTML help system produced an empty index page.
- The parser now gives an error if a null character is included in a string using Unicode escapes. (PR#16046)
- `qr.Q()` failed on complex arguments due to pre-3.0(!) typo. (PR#16054)
- `abs()` failed with named arguments when the argument was complex. (PR#16047)
- `"noquote"` objects may now be used as columns in dataframes. (PR#15997)
- Some values with extremely long names were printed incorrectly. (PR#15999)
- Extremely large exponents on zero expressed in scientific notation (e.g. `0.0e50000`) could give `NaN`. (PR#15976)
- `download.file()` reported downloaded sizes as 0KB if less than 1MB, only for R 3.1.2 and only on big-endian platforms.
- `prompt()` did not escape percent signs in the automatically generated usage section of help files.
- `drop.terms()` dropped some of the attributes of the object it was working with. (PR#16029)
- (Windows.) The command completion in `Rgui.exe` messed up the console. (PR#15791)
- (Windows.) The `choose.files()` command returned a blank string when the user asked for a single file but cancelled the request. (PR#16074)
- `Math2` S4 group generics failed to correctly dispatch `"structure"`- and `"nonStructure"`-derived classes.
- `loadNamespace()` imposed undocumented restrictions on the `versionCheck` parameter. (Reported by Geoff Lee.)
- Rare over-runs detected by AddressSanitizer in `substr()` and its replacement version have been avoided.

  Inter alia that fix gives the documented behaviour for `substr(x,1,2) <-""` (subsequently reported as PR#16214).
- Loading packages incorrectly defining an S4 generic followed by a function of the same name caused an erroneous cyclic namespace dependency error.
- Declared vignette encodings are now always passed to the vignette engine.
- Port Tomas Kalibera's fix from R-devel that restores the `loadMethod()` fast path, effectively doubling the speed of S4 dispatch.
- `power.t.test()` and `power.prop.test()` now make use of the `extendInt` option of `uniroot()` and hence work in more extreme cases. (PR#15792)
- If a package was updated and attached when its namespace was already loaded, it could end up with parts from one version and parts from the other. (PR#16120)
- `tools:::.Rdconv()` didn't accept `--encoding=` due to a typo. (PR#16121)
- Unix-alike builds without a suitable `makeinfo` were documented to link the missing HTML manuals to CRAN, but did not.

- `save(*,ascii=TRUE)` and `load()` now correctly deal with `NaN`'s. (PR#16137)
- `split.Date()` retains fractional representations while avoiding incomplete class propagation.
- 'R_ext/Lapack.h' had not been updated for changes made by LAPACK to the argument lists of its (largely internal) functions `dlaed2` and `dlaed3`. (PR#16157)
- `RShowDoc("NEWS","txt")` had not been updated for the layout changes of R 3.1.0.
- The `xtfrm()` method for class `"Surv"` has been corrected and its description expanded.
- `mode(x) <-y` would incorrectly evaluate `x` before changing its mode. (PR#16215)
- `besselJ(1,2^64)` and `besselY(..)` now signal a warning, returning `NaN` instead of typically segfaulting. (Issue 3 of PR#15554)
- HTML conversion of '`\href`' markup in '.Rd' files did not remove the backslash from '`\%`' and so gave an invalid URL. In a related change, the '`\`' escape is now required in such URLs.