Homebrew on ARM64 Linux

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About myself

- Student at School of Computing, National University of Singapore, specialising in Infocomm Security
- Homebrew maintainer since 2023
- Raspberry Pi user since 2020, always wanted to run Homebrew on it

What is Homebrew?

- ▶ The Missing Package Manager for macOS (or Linux)
  - ▶ macOS: x86-64 (64-bit Intel) and ARM64 (Apple Silicon)
  - ▶ Linux: x86-64

  Homebrew is not officially supported on ARM64 Linux!

Why use Homebrew on ARM64 Linux?

- ▶ To install up-to-date software packages that are not available from the distro's package manager
- ▶ To install software packages without root privileges
- ▶ You like Homebrew like I do

What are needed to run Homebrew on ARM64 Linux?

- ▶ Curl and Git
- ▶ Build tools that support building software from source,
  e.g., Make and GCC
- ▶ Ruby

For more information, see `https://docs.brew.sh/Homebrew-on-Linux`

Installing Ruby for Homebrew may not be straightforward!

- ▶ Needs to match Homebrew's version requirement (updated somewhat frequently)
- ▶ May require building from source (e.g., using a Ruby version manager like rbenv)
- ▶ For officially supported platforms, Homebrew provides Portable Ruby so that you don't have to build Ruby yourself

Homebrew Portable Ruby

- ▶ Homebrew's build of Ruby that can be installed and run from anywhere on the filesystem, designed for use internally to Homebrew
- ▶ Available for macOS and x86-64 Linux, but not for ARM64 Linux...
  But good news: we're on it now!
- ▶ Thanks to GitHub Actions' new ARM64 Linux runners, we can now build Portable Ruby for ARM64 Linux too

Is Homebrew fully functional on ARM64 Linux now?

- ▶ Yes: you should be able to use Homebrew mostly without issues (like I do)
- ▶ No: there are no bottles (pre-built binary packages) for the platform yet so everything has to be built from source
    - ▶ Build failures are very possible due to complexities in software environments (It worked on my machine last week!?)
    - ▶ Pull requests to fix build failures are welcome (as long as reasonable)

Work needed to make bottles available for ARM64 Linux

- ▶ glibc bootstrapping: Homebrew's bottles are built against the glibc from CI (currently glibc 2.35) so we need to support bootstrapping that glibc on older systems
  - ▶ For more information, see `https://docs.brew.sh/Linux-CI`
- ▶ Build and test all packages for ARM64 Linux
  - ▶ Requires more CI capacity and even more maintainer efforts
  - ▶ May (or may not) eventually happen, but not on the plan yet

What's next?

- ▶ While not officially supported, Homebrew on ARM64 Linux is already very much possible
- ▶ Work is still being done to improve the experience
    - ▶ But please don't expect official, first-class support soon!
- ▶ Pull requests are welcome!

Thank you!