

Creating a Striped Horse Build Environment

The following dependencies are required in order to set up a build environment for Striped Horse. Additional runtime library development packages may be required and are specified in the [Building Striped Horse](#) document.

- autoconf v2.69
- autoconf-archive 2018.03.13
- automake v1.16.1
- GCC 8.2
- Binutils 2.31.1 (patched)
- CUPS 2.2
- libffi
- libyaml
- m4 1.4.18
- Ruby 1.9.3-p551

If these packages are already available on the system at the same or higher versions, it may not be necessary to compile them below, however, for a complete build system that is known to build Striped Horse correctly, the following steps can be taken.

Steps

Compile GCC 8.2

```
tar xf gcc-8.2.0.tar
cd gcc-8.2.0
contrib/download_prerequisites
mkdir build
cd build
../configure --disable-gold --disable-multilib --enable-languages=c,c++
--prefix=/opt/TAP/gcc-8.2
make
sudo make install
```

Compile Binutils 2.31.1

Save this patch as `binutils.patch`

binutils.patch

```
diff --git a/ld/scripttempl/elf.sc b/ld/scripttempl/elf.sc
index 444aef2942..8a3858d32b 100644
--- a/ld/scripttempl/elf.sc
+++ b/ld/scripttempl/elf.sc
@@ -637,9 +637,9 @@ cat <<EOF
     ${SDATA_GOT+${OTHER_GOT_SECTIONS}}
     ${DATA_SDATA-${SDATA}}
     ${DATA_SDATA-${OTHER_SDATA_SECTIONS}}
-    ${RELOCATING+${DATA_END_SYMBOLS-${CREATE_SHLIB+PROVIDE
+    (${USER_LABEL_PREFIX}_edata = .${CREATE_SHLIB+}); PROVIDE
+    (${USER_LABEL_PREFIX}_edata = .);}}
+    ${RELOCATING+${DATA_END_SYMBOLS-${USER_LABEL_PREFIX}_edata = .;
PROVIDE (${USER_LABEL_PREFIX}_edata = .);}}
     ${RELOCATING+. = .;}
-    ${RELOCATING+${CREATE_SHLIB+PROVIDE (${USER_LABEL_PREFIX}__bss_start
+    = .${CREATE_SHLIB+});}
+    ${RELOCATING+${USER_LABEL_PREFIX}__bss_start = .;}
     ${RELOCATING+${OTHER_BSS_SYMBOLS}}
     ${DATA_SDATA-${SBSS}}
     ${BSS_PLT+${PLT}}
@@ -672,7 +672,7 @@ cat <<EOF
     ${LARGE_BSS_AFTER_BSS-${LARGE_BSS}}
     ${RELOCATING+. = ALIGN(${ALIGNMENT});}
     ${RELOCATING+${OTHER_END_SYMBOLS}}
-    ${RELOCATING+${END_SYMBOLS-${CREATE_SHLIB+PROVIDE
+    (${USER_LABEL_PREFIX}_end = .${CREATE_SHLIB+}); PROVIDE
+    (${USER_LABEL_PREFIX}_end = .);}}
+    ${RELOCATING+${END_SYMBOLS-${USER_LABEL_PREFIX}_end = .; PROVIDE
+    (${USER_LABEL_PREFIX}_end = .);}}
     ${RELOCATING+${DATA_SEGMENT_END}}
     ${TINY_DATA_SECTION}
     ${TINY_BSS_SECTION}
```

```
tar xf binutils-2.31.1.tar
cd binutils-2.31.1
patch -pl < path/to/binutils.patch
./configure --disable-gold --prefix=/opt/TAP/gcc-8.2
make
sudo make install
```

Compile CUPS 2.2

```
tar xf cups-2.2.0.tar
cd cups-2.2.0
./configure --disable-gnutls --prefix=/opt/TAP/gcc-8.2
make
sudo make install
```

Compile libffi

```
git clone https://github.com/libffi/libffi.git
cd libffi
git checkout a5ea7527
./configure --prefix=/opt/TAP/gcc-8.2
make
sudo make install
```

Compile libyaml

```
git clone https://github.com/yaml/libyaml.git
cd libyaml
git checkout 85d1f168
./configure --prefix=/opt/TAP/gcc-8.2
make
sudo make install
```

Compile Ruby 1.9.3-p551 (and install fpm)

Note that even if GCC 8.2 is in the `PATH` environment variable, any native ruby gems that need to be compiled will use the system's compiler unless the assembler and compiler environment variables were set during the configure phase.

```
tar xf ruby-1.9.3-p551.tar
cd ruby-1.9.3-p551.tar
export AS=/opt/TAP/gcc-8.2/bin/as
export CC=/opt/TAP/gcc-8.2/bin/gcc
export CXX=/opt/TAP/gcc-8.2/bin/g++
export LDFLAGS=-L/opt/TAP/gcc-8.2/lib -Wl,-rpath /opt/TAP/gcc-8.2/lib
-L/opt/TAP/gcc-8.2/lib64 -Wl,-rpath /opt/TAP/gcc-8.2/lib64
./configure --prefix=/opt/TAP/gcc-8.2
make
sudo make install
sudo gem install fpm
```

Patch fpm

By default, fpm sets the mode of the "templates" file in Debian packages to executable, but lintian complains that this file should not be executable. A pull request has been made, but at this current time, it has not been merged. The following patch can be downloaded and applied to the system's fpm gem.

fpm.patch

```
diff --git a/lib/fpm/package/deb.rb b/lib/fpm/package/deb.rb
index 230e9dc..f2e2e14 100644
--- a/lib/fpm/package/deb.rb
+++ b/lib/fpm/package/deb.rb
@@ -901,7 +901,7 @@ class FPM::Package::Deb < FPM::Package

    if attributes[:deb_templates]
      FileUtils.cp(attributes[:deb_templates],
control_path("templates"))
-      File.chmod(0755, control_path("templates"))
+      File.chmod(0644, control_path("templates"))
    end
  end # def write_debconf
```

Apply the patch:

```
cd /opt/TAP/gcc-8.2/lib/ruby/gems/1.9.1/gems/fpm-1.10.2
sudo patch -p1 < path/to/fpm.patch
```

Installing autoconf and m4

```
tar xf m4-1.4.18.tar
cd m4-1.4.18
./configure --prefix=/opt/TAP/gcc-8.2
make
sudo make install
```

```
tar xf autoconf-2.69.tar
cd autoconf-2.69
./configure --prefix=/opt/TAP/gcc-8.2
make
sudo make install
```