# OS Project 环境

#### 需要下载的:

https://jbox.sjtu.edu.cn/l/qFUZFh

需要安装的: docker、qemu(需要包含qemu-riscv64)、gdb-multiarch(如果需要调试)

在下载好文件之后(一个tar),请在命令行内导入编译工具包。

docker load --input riscv64-build.tar

#### **MacOS**

第一步: 确保你已经有了开发者工具, 如果没有执行如下语句安装:

\$ xcode-select --install

第二步:安装Homebrew包管理工具。

\$ /usr/bin/ruby -e "\$(curl -fsSL
https://raw.githubusercontent.com/Homebrew/install/master/install)"

第三步:安装RISC-V编译工具链

\$ brew tap riscv/riscv

\$ brew install riscv-tools

在这一步你可能需要手动将编译工具链的位置加入到环境变量中,一般情况

为 PATH=\$PATH:/usr/local/opt/riscv-gnu-toolchain/bin, 具体路径请根据实际情况更改。安装这一过程可能会耗费较多时间并且可能需要反复执行。

第四步: 安装qemu

\$ brew install qemu

第五步: 检查版本

```
$ riscv64-unknown-elf-gcc --version
riscv64-unknown-elf-gcc (GCC) 10.2.0
Copyright (C) 2020 Free Software Foundation, Inc.
This is free software; see the source for copying conditions. There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

$ qemu-system-riscv64 --version
QEMU emulator version 5.0.0
Copyright (c) 2003-2020 Fabrice Bellard and the QEMU Project developers
```

### **Debian/Ubuntu**

通过apt安装包

```
sudo apt-get install git build-essential gdb-multiarch qemu-system-misc gcc-
riscv64-linux-gnu binutils-riscv64-linux-gnu
```

由于一些奇怪的原因,需要fix gemu

```
$ sudo apt-get remove qemu-system-misc
$ sudo apt-get install qemu-system-misc=1:4.2-3ubuntu6
```

#### Arch

```
sudo pacman -S riscv64-linux-gnu-binutils riscv64-linux-gnu-gcc riscv64-linux-
gnu-gdb qemu-arch-extra
```

## **From Source**

First, clone the repository for the RISC-V GNU Compiler Toolchain:

```
$ git clone --recursive https://github.com/riscv/riscv-gnu-toolchain
```

Next, make sure you have the packages needed to compile the toolchain:

```
$ sudo apt-get install autoconf automake autotools-dev curl libmpc-dev libmpfr-dev libgmp-dev gawk build-essential bison flex texinfo gperf libtool patchutils bc zliblg-dev libexpat-dev
```

Configure and build the toolchain:

```
$ cd riscv-gnu-toolchain
$ ./configure --prefix=/usr/local
$ sudo make
$ cd ..
```

Next, retrieve and extract the source for QEMU 5.1.0:

```
$ wget https://download.qemu.org/qemu-5.1.0.tar.xz
$ tar xf qemu-5.1.0.tar.xz
```

Build QEMU for riscv64-softmmu:

```
$ cd qemu-5.1.0
$ ./configure --disable-kvm --disable-werror --prefix=/usr/local --target-
list="riscv64-softmmu"
$ make
$ sudo make install
$ cd ..
```

# **Windows**

未测试,不保证使用正确性。