RISCV-Tool Installing Guideline

Version 1.0  
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**History**

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| --- | --- | --- |
| **Version** | **Update content** | **Release Date** |
| V1.0 | Initial Version | 08-20-2018 |
| V1.0 | Add section 1.3.4, 1.3.5 | 08-21-2018 |

# RISCV-Tool Installing

## Install Packets needed

$ sudo apt-get install autoconf automake autotools-dev curl libmpc-dev libmpfr-dev libgmp-dev libusb-1.0-0-dev gawk build-essential bison flex texinfo gperf libtool patchutils bc zlib1g-dev device-tree-compiler pkg-config libexpat-dev

## Install Riscv-Tool

**#Git clone**

$ git clone https://github.com/riscv/riscv-tools

$ git submodule update --init --recursive

**#Export Variable**

$ sudo -i

$ export RISCV=</path/to/install/riscv/toolchain>

$ export PATH=${PATH}:${RISCV}/bin

**#Build Tool-chain (for RV64 ISA)**

$ ./build.sh

**#Build Tool-chain (for RV32 ISA)**

$ ./build-rv32ima.sh

## Build Hello.C

### Write simple program (hello.c)

#include <stdio.h>

int main(void) {

printf("Hello World\n");

return 0;

}

### Cross-compile

**#For RV64**

$ riscv64-unknown-elf-gcc -o hello hello.c

**#For RV32**

$ riscv32-unknown-elf-gcc -o hello hello.c

### Execute

**#Using spike**

$ spike pk hello

**#Using rocket**

**#Using angel**

**#Using qemu**

### Inspect the output binary

**#RISCV64**

$ riscv64-unknown-elf-readelf -a hello

$ riscv64-unknown-elf-objdump -d hello

**#RISCV32**

$ riscv32-unknown-elf-readelf -a hello

$ riscv32-unknown-elf-objdump -d hello

### Generate Hex file for Hardware check

riscv32-unknown-elf-objcopy -O verilog input.elf output.vh #load by Verilog readmemh

riscv32-unknown-elf-objcopy -O ihex input.elf output.hex #intel hex format

## Reference Source

1. <https://riscv.org/software-tools/>
2. <https://riscv.org/wp-content/uploads/2015/02/riscv-software-stack-tutorial-hpca2015.pdf>
3. <https://github.com/ucb-bar/riscv-sodor#building-a-rv32i-toolchain>
4. <https://stackoverflow.com/questions/36648190/how-can-i-generate-a-hexfile-from-c-code-for-testing-a-32-bit-risc-v-hardware-de>

# New Source

## Link

<https://github.com/riscv/riscv-gnu-toolchain>

<https://risc-v-getting-started-guide.readthedocs.io/en/latest/linux-qemu.html>

## Install package

$ sudo apt-get install autoconf automake autotools-dev curl python3 libmpc-dev libmpfr-dev libgmp-dev gawk build-essential bison flex texinfo gperf libtool patchutils bc zlib1g-dev libexpat-dev

## Getting the sources

### All version sources

This repository uses submodules. You need the --recursive option to fetch the submodules automatically.

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

Alternatively:

$ git clone <https://github.com/riscv/riscv-gnu-toolchain>

$ cd riscv-gnu-toolchain

$ git submodule update --init --recursive

### Minimum source (git with the shortest time)

This repository uses submodules. You need the --recursive option to fetch the submodules automatically. --depth 1 to get lastest version only.

$ git clone --depth 1 --recursive <https://github.com/riscv/riscv-gnu-toolchain>

## Configure

Target: riscv32-unknown-elf or riscv64-unknown-elf

$ ./configure --target=riscv32-unknown-elf

## Install

$ make && make install

# Install RISCV Toolchain on Windows

<https://gnu-mcu-eclipse.github.io/toolchain/riscv/install/>