

## 1 Install & Sanity-Check the Toolchain

I have downloaded riscv-toolchain-rv32imac-x86\_64-ubuntu.tar.gz. How exactly do I unpack it, add it to PATH, and confirm the gcc, objdump, and gdb binaries work?

### Response

#### Step 1: Unpack the tar.gz File

Open your terminal and run:

```
tar -xvf riscv-toolchain-rv32imac-x86_64-ubuntu.tar.gz
```

This will extract a folder—let's assume it's named riscv.

#### Step 2: Move It to a Standard Location (Optional but Recommended)

You can move it to /opt (or anywhere you prefer):

```
Sudo mv riscv /opt/riscv
```

#### Step 3: Add the Toolchain to Your PATH

Edit your shell config file (e.g., .bashrc, .zshrc, etc.) and add:

```
export PATH=/opt/riscv/bin:$PATH
```

Then source the file to apply changes:

```
source ~/.bashrc
```

#### Step 4: Verify the Installation

Run the following commands to check:

```
riscv32-unknown-elf-gcc --version
```

```
riscv32-unknown-elf-objdump --version
```

```
riscv32-unknown-elf-gdb --version
```

If installed correctly, each should return its respective version info.

```
yogesh@DESKTOP-PB6A90R:/mnt/c/Users/Sai Yogeshwar/Downloads$ riscv32-unknown-elf-gcc --version
riscv32-unknown-elf-gcc (g04696df096) 14.2.0
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yogesh@DESKTOP-PB6A90R:/mnt/c/Users/Sai Yogeshwar/Downloads$ riscv32-unknown-elf-objdump --version
GNU objdump (GNU Binutils) 2.43.1
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This program is free software; you may redistribute it under the terms of
the GNU General Public License version 3 or (at your option) any later version.
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yogesh@DESKTOP-PB6A90R:/mnt/c/Users/Sai Yogeshwar/Downloads$
```