MP0: Setting Up a Kernel Development Environment

CS 423: Operating System Design

Fall 2025

Important Dates

- **MP0 is released today.**

- **The due date is 9/16.**

- **MP0 will cost you from several minutes to a few hours, depends on your machine's performance.**

Goals

- In this MP you will learn to download, compile, and test your own kernel.

- You will configure your development environment for upcoming MPs.

- The kernel source code will be a helpful reference.

What you need

- A Linux environment to compile your kernel.

- You can either use a bare-metal machine or a VM.

- We will provide a QEMU script, and you will use QEMU to test it.

Linux VM Setup

- If you are planning to use a bare metal machine, ignore this part.

- To setup VM, you will need a hypervisor.

- This depends on your current OS.

- Be sure that you turn on nested virtualization.

Windows

- **Most modern Windows PCs ships with a Hyper-V hypervisor.**

- **It is very nasty to turn it off especially in Win11 24H2.**

- **In this case, we recommend WSL 2. Follow the instructions on the website.**

- **If you have already turned it off, you can use third-party hypervisors like VirtualBox, VMware Workstation.**

macOS

- **If you are using Apple Silicon (ARM) based Mac, use UTM.**

- **If you are using Intel (x86) based Mac, there are plenty of choices like**

  VirtualBox, VMware Fusion, and Parallels.

Linux

- **You can use bare metal machine to compile and run kernel directly, or compile inside a docker container if toolchain versions mismatch.**
  (try ubuntu:jammy **if you are looking for the image)**

- **VirtualBox, VMware Workstation are also available**

Install Linux VM

- ## We recommend Ubuntu Server 24.04.

- ## Check "Install OpenSSH Server" during the installation.

- ## Use your favorite SSH client and terminal simulator to connect.

- ## May also use external editors + SSH (like VSCode).

Demo

Submission

- **Submit to Google Form (posted on the MP0 doc).**

- dmesg | grep 'Linux version'

- **Requires Illinois login.**

- **We will use your last submission for grading.**

Q/A