Operating Systems
Tutorial 2:Pintos Compilation and Installation

Nguyen Trung Nam (tutor)

Hanoi University of Science and Technology

Compiled with reference to other presentations

Guide

Download Qemu Emulator Software & Pintos Source Code

Install Pintos and Run Examble Program

Introduction

- Qemu is a free and open-source emulator and virtualizer that can perform hardware virtualization.
- Pintos is a simple operating system framework for the 80x86 architecture.
- Pintos support kernel threads,loading and running user programs and a file system.

Requirement

- Ubuntu 18.04 or 20.04 LTS.
- 5GB ROM.
- 2 - 4GB RAM.

Download

1. Download Qemu Emulator :
   sudo apt-get install qemu-system
2. Download latest Pintos source code from:
   https://github.com/WyldeCat/pintos-anon
   Note : Do not download the old version.

3. Unzip Pintos .tar.gz

4. Open file **/utils/pintos-gdb** with Vim.
Edit **GDBMACROS** variable, assign your own Pintos full path to /src/misc/gdb-macros.

5.In /utils/, open the **Makefile** with Vim and **LOADLIBES** variable name is edited as **LDLIBS.**

6. Open terminal in **/src/utils** and type "**make**" to compile utils.

For error "stropts.h not found" (e.g. Ubuntu 20.04 LTS), see https://github.com/huawenyu/pintos to correct codes. Specifically, you must remove #include <stropts.h> in squish-pty.c and squish-unix.c, and statements that call isastream

7. Edit **/src/threads/Make.vars**

Line 7 : change **bochs** for **qemu**.

8.In **/src/threads**, type "**make**" in terminal to compile the thread directory.

9. Edit **/utils/pintos**

Line 103: Replace **bochs** with **qemu**.

Line 257: Replace **kernel.bin** with the full path (...src/threads/build/kernel.bin).

Line 621: Replace **qemu-system-i386** with **qemu-system-x86_64**

10. Edit **/utils/Pintos.pm**

Line 362: Replace **loader.bin** for the full path (...src/threads/build/loader.bin)

11. Edit **~/.bashrc** in **/home/** directory
Add **“export PATH=/home/…/pintos/src/utils:$PATH”** at the last line.
12. Type “**source ~/.bashrc**” in the terminal.
13. Run “**pintos run alarm-multiple**”

Examble

Turn off or Reboot Emulator :

- Edit **/src/threads/init.c** :
  Line 136 : edit “**shutdown()”** to “**shutdown_power_off()**”
- In directory **/src/threads**, type “**make**” to recompile the thread directory.
- Run “**pintos run alarm-multiple**” .