Operating Systems II Homework 1

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Prepared by

Group 4

Corinna Brown
Zachary Comito
Corwin Perren

Abstract

The document is our groups submission for homework one covering the commands our group ran to finish the assignment, descriptions of qemu flags, answers to explicit assignment questions, a version control log, and work log.

CONTENTS

1 COMMANDS

- mkdir /scratch/spring2018/4
- cd /scratch/spring20128/4
- git init
- wget http://git.yoctoproject.org/cgit.cgi/linux-yocto/snapshot/linux-yocto-3.19.2.tar.bz2
- tar xvjf linux-yocto-3.19.2.tar.bz2
- cp /scratch/files/bzImage-qemux86.bin .
- cp /scratch/files/core-image-lsb-sdk-qemux86.ext4 .
- cp /scratch/files/config-3.19.2-yocto-standard .config
- source /scratch/files/environment-setup-i586-poky-linux.csh
- make -j4
- qemu-system-i386 -gdb tcp::5004 -nographic -kernel bzImage-qemux86.bin -drive file=core-image-lsb-sdk-qemux86.ext4,if=vir
  -enable-kvm -net none -usb -localtime –no-reboot –append ”root=/dev/vda rw console=ttyS0 debug”.

2 QEMU FLAGS

- `-gdb tcp::????`

  Waits for a GDB connection on the specified device, namely a TCP connection on port ????.
- `-S`

  Prevents the CPU from starting up when first launching the command.
- `-nographic`

  Disables graphical capabilities and turns qemu into a command line application.
- `-kernel bzImage-qemux86.bin`

  Uses the “`bzImage-qemux86.bin`” binary as the kernel image to boot.
- `-drive file=core-image-lsb-sdk-qemux86.ext4,if=virtio`

  Uses “`core-image-lsb-sdk-qemux86.ext4`” as the file for the virtual hard drive, and virtio as the I/O interface (virtio virtualizes I/O operations like disk reads/writes).
- `-enable-kvm`

  Enables use of kernel-based virtual machine technology.
- `-net none`

  Indicates that no network devices should be configured.
- `-usb`

  Enables USB drivers.
- `-localtime`

  Uses the local time from the host machine to set the time in the guest, instead of the default of UTC time.
- `--no-reboot`

  Shuts down the guest entirely on exit instead of rebooting.
- `--append "root=/dev/vda rw console=ttyS0 debug"`

  Uses "`root=/dev/vda rw console=ttyS0 debug`" as the initial command line, running it on initial boot.

3 QUESTIONS

3.1 Point of Assignment

The point of this assignment was to make sure that our group could properly get the course's development environment up and running. Additionally, it gave us initial experience with using qemu, as that will be a core tool used during this class. Setting up the git repository also was needed to ensure both the instructors and our group can keep track of changes made to the kernel as we work on assignments over the term.

3.2 Problem Approach

We approached this problem by systematically following the directions on the homework page, and making adjustments as necessary to fit our particular development environment. Where needed, we also looked up documentation through man pages and the internet.

3.3 Correctness

We know that the end result was correct as we were able to successfully compile the kernel and boot the kernel in the emulator.

3.4 What Was Learned

We learned how to set up the environment needed to both build and run a custom modified linux kernel in a virtual machine.

4 VERSION CONTROL LOG

Detail	Author	Date	Description
c52f73e	Corwin Perren	2018-04-09 17:39:17 -0700	Added initial kernel to our group folder.
974b452	Corwin Perren	2018-04-09 18:48:36 -0700	Initial commit after first build

5 WORK LOG

- 2018-04-09
  - Group met in valley library
  - Set up initial os2 server workspace
  - Ran make on kernel for first time
  - Booted virtual machine for first time
  - Wrote latex document for homework 1