OPERATING SYSTEMS II HW1 WRITEUP

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Abstract

This document is the writeup for homework 1 of Operating Systems II Spring term 2018, written by Group 20.

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1 LOG OF COMMANDS

The directory for the group was created by navigating to the proper directory, followed by a mkdir. Permissions were granted so the whole group could access this directory:

```
cd /scratch/spring2018
mkdir group20
chmod -R 777 group20
```

We then sourced the environment using:

```
source /scratch/files/environment-setup-i586-poky-linux.csh
```

The kernel image was pulled from the supplied repository and unpacked:

```
tar xvjf linux-yocto-3.19.2.tar.bz2
```

We then copied the configuration file, and placed it in the root of the linux tree, then renamed it to .config:

```
cd /scratch/spring2018/group20/linux-yocto-3.19.2
cp /scratch/files/config-3.19.2-yocto-standard .
mv config-3.19.2-yocto-standard .config
```

The kernel was then built using 4 threads:

```
make -j4 all
```

The VM was then ran with the following command:

```
qemu-system-i386 -gdb tcp::5520 -S -nographic -kernel linux-yocto-3.19.2/arch/i386/boot/bZimage
    / -drive file=core-image-lsb-sdk-qemux86.ext4,if=virtio -enable-kvm -net none -usb -localtime
    / --no-reboot --append "root=/dev/vda rw console=ttyS0 debug"
```

GDB was used to continue the process:

```
gdb -tui
    remote target localhost:5520
    continue
```

The following was used to verify that the kernel was indeed the custom kernel that was just built:

```
uname -a
    Linux qemux86 3.19.2Group20Makefile-group2-config-file+ #1 SMP PREEMPT Thu Apr 12 09:02:01 PDT
        / 2018 i686 GNU/Linux
```

Compared to the provided kernel:

```
uname -a
    Linux qemux86 3.19.2-yocto-standard #1 SMP PREEMPT Wed Apr 1 00:11:06 GMT 2015 i686 GNU/Linux
```

2 QEMU FLAGS AND EXPLANATIONS

Flags:

- -gdb tcp::5520:

  Waits for gdb tcp connection

- -S:

  Shorthand for -gdb tcp::5520, opens gdbserver on TCP port 5520

- -nographic:

  Disables graphical output

- -kernel linux-yocto-3.19.2/arch/i386/boot/bzimage

  Selects bzimage as the kernel to load

- -drive file=core-image-lsb-sdk-qemux86.ext4,if=virtio -enable-kvm

  Defines a new virtual drive, and uses Virtio and enables KVM if available.

- -net none

  Disables network

- -usb

  Enables USB driver

- -localtime

- –no-reboot

  Specify VM to exit instead of rebooting

- –append "root=/dev/vda rw console=ttys0 debug"

  give kernel command line arguments to specify root directory, and to use ttys0 as debug console

3 VERSION CONTROL LOG

Author	Date	Message
nickywongdong	2018-04-08	first commit
nickywongdong	2018-04-10	copying and unpacking yocto 3.19.2 image
nickywongdong	2018-04-10	copying .ext4 driver file using tar, and adding gitignore for the file
nickywongdong	2018-04-10	adding a gitignore in the hw directory as well
nickywongdong	2018-04-12	unpacking initial kernel from repo
nickywongdong	2018-04-12	adding custom version tag to Makefile under extra version
nickywongdong	2018-04-12	copying config from /scratch/files and renaming to .config, then running make menuconfig (don't know if we need this step or not)
nickywongdong	2018-04-12	moving into one git repo after build of final kernel. Adding initial state of writeup for latex
nickywongdong	2018-04-12	attempt to merge intial git with new repo
nickywongdong	2018-04-12	moving kernel outside of hw directories
nickywongdong	2018-04-12	finalizing moving kernel root tree outside of hw directory
nickywongdong	2018-04-12	adding git log latex table generator
nickywongdong	2018-04-12	changing git log table generator, previous required certain installation and rights
nickywongdong	2018-04-12	updating gitignore, removing previous latex-git-log
nickywongdong	2018-04-12	moving to local machine to generate log table

4 WORK LOG

April 9	Initial build of kernel using 3.19
April 10	Running qemu with provided images for testing
April 10	Rebuild with 3.19.2 to include logs, and to use config file
April 10	Initial run of qemu with built kernel
April 12	Removal of build, building with team
April 12	Attempt to add permissions for directory
April 12	Testing kernel build for another user in group directory (sekmo)
April 12	Kernel build and run unsucessful, attempting to rebuild under initial user (wongnich)
April 12	Modifying config, and Makefile to include custom system version tag
April 12	Moving kernel build of second user to -OLD, permissions not set correctly for removal
April 12	Rebuild of kernel to include custom tags, and git logs within linux root tree
April 12	Attempt to run permissions script provided for teammates