Project 1

CS444 - Spring 2017

Taylor Thomas, Aravind Parasurama, Justin Brown

Abstract

The following document contains information about the producer-consumer problem solution as well as the steps taken to setup the kernel for the first part of the assignment. Included is a version control log to show when the work was done through github.

CONTENTS

1 Command Log 2

2 Concurrency Solution 3

2.1 What do you think the main point of the assignment was? 3

2.2 How did you personally approach the problem? 3

2.3 How did you ensue your solution was correct? 3

2.4 What did you learn? 3

3 Qemu Command-Line Flags 3

4 Version Control Log 4

5 Work Log 4

1 COMMAND LOG

1) ssh os-class
2) cd/scratch/spring2017/13-06
3) git clone git://git.yoctoproject.org/linux-yocto-3.14
4) cd linux-yocto-3.14
5) git checkout v3.14.26
6) source /scratch/opt/environment-setup-i586-poky-linux.csh
7) cp /scratch/spring2017/files/config-3.14.26-yocto-qemu.config
8) make menuconfig
9) /LOCALVERSION
10) 1
11) edit value to: -13-06-hw1
12) make -j4 all
13) cd ..
14) gdb
15) in terminal 2: source /scratch/opt/environment-setup-i586-poky-linux.csh
16) cp /scratch/spring2017/files/bzImage-qemux86.bin.
17) /scratch/spring2017/files/core-image- lsb-sdk-qemux86.ext3 .
18) qemu-system- i386 -gdb tcp::5601 -S -nographic -kernel bzImage-qemux86.bin -drive file=core-image- lsb-sdk-qemux86.ext3,if=virtio -enable-kvm -net none-usb-localtime–no-reboot – append ”root=/dev/vda rw console=ttyS0 debug”
19) in terminal 1: target remote :5601
20) continue
21) for username type: root
22) uname -a
23) reboot
24) qemu-system- i386 -gdb tcp::5601 -S -nographic -kernel linux-yocto- 3.14/arch/x86/boot/bzImage -drive file=core-image- lsb-sdk- qemux86.ext3,if=virtio -enable- kvm -net none -usb -localtime – no-reboot – append ”root=/dev/vda rw console=ttyS0 debug”
25) target remote :5601
26) for username type: root
27) uname -a
28) reboot
29) q

2 Concurrency Solution

2.1 What do you think the main point of the assignment was?

The main point of the assignment was to get more experience with thinking about concurrency, and thinking in the parallel programming paradigm when designing solutions.

2.2 How did you personally approach the problem?

At first we did research to get some background information on the producer consumer problem. Once we had a good background of the problem we were able to get started implementing the solution. As far as the implementation went the main components consisted of the producer function, the consumer function and the buffer. We began to work on implementing these components one by one until the program converged in the end.

2.3 How did you ensue your solution was correct?

We ensued that our solution was correct by printing the values that were produced by the producer and consumed by the consumer.

2.4 What did you learn?

As a group we learned how to use pthreads at a higher level than before. This assignment also gave me a better understanding of parallel programming.

3 QEMU Command-Line Flags

- -gdb tcp::5601 - Open a GDB server on TCP port 5601
- -S - Do not start the CPU at startup.
- -nographic - Disables graphical output so that QEMU is a command line operation.
- -kernel linux-yocto-4.14/arch/x86/boot/bzImage - Uses this bzImage as a kernel image.
- -drive file=core-image-quemux86.ext3 - Defines a new drive with the file option set.
- if=virtio
- -enable-kvm - Enables KVM virtualization report.
- -net none - Indicates that no network devices should be configured.
- -usb - Enables the USB driver.
- -localtime - Gives the local time.
- – no-reboot
- – apend ”root=/dev/vda rw console=ttyS0 debug” - Uses the argument as the kernel command line.

4 VERSION CONTROL LOG

User	Commit Message	Date
bitschift	added producer-consumer	April 20th
bitschift	added some function prototypes	April 20th
bitschift	Added rand num and isx86 functionsr	April 21st
bitschift	Added 64bit rand num support	April 21st
bitschift	fleshed out producer	April 21st
bitschift	fleshed out consumer	April 21st
bitschift	fixing bugs	April 21st
bitschift	fix bugs	April 21st
bitschift	more bug fixes	April 21st
itztt23	adding assignment 1 docs	April 21st
itztt23	added commands for the writeup	April 21st
itztt23	added qemu command-line flag descriptions	April 21st

5 WORK LOG

- April 16th - began working on the kernel part of the assignment
- April 20th - began working on the producer function
- April 20th - began working on the consumer function
- April 20th - built the buffer
- April 21st - began writing up the documents
- April 21st - solved the problem of the consumer consuming empty values
- April 21st - finished the write-up
- April 21st - finished the concurrency assignment