摘要

在本科期间，我们就学习过操作系统、计算机组成原理、计算机体系结构等课程，但是发现都学的不够深入，而一个完整的商用的计算机操作系统，难度十分巨大，操作起来难度巨大。而从零开始实现一个简单的操作系统内核，不仅能起到对本科所学的计算机知识的综合应用，并且能为以后阅读甚至开发一个大型商用操作系统做铺垫。

本次毕业设计所做的操作系统内核的结构很简单，但是麻雀虽小五脏俱全，主要包含Loader的实现、内核整体结构的搭建、进程管理、文件管理、内存管理、多控制台输入输出系统管理。并采用命令行的用户交互方式，并通过调用设计的系统调用，完成了echo、pwd简单命令的编写以及键盘的输入输出交互。

本文首先介绍操作系统的基础知识以及主要的功能，并结合所依赖的运行环境进行简述，然后对X86架构下的IA32的保护模式进行全面分析研究。接着就是对操作系统开发工具、运行环境以及所用到的语言等进行简述，然后重点说明了操作系统内核实现的原理以及具体的设计和实现，最后将调用设计的系统调用，完成基本的命令以键盘控制功能。

关键词：内核；操作系统；IA32保护模式；简单的shell

ABSTRACT

During our undergraduate years, we took courses such as operating systems, principles of computer composition, computer architecture, and so on, but found that they were not deep enough, and that a complete commercial computer operating system was very difficult. The operation is very difficult. The implementation of a simple operating system kernel from scratch can not only play a comprehensive application to the computer knowledge learned in undergraduate course, but also pave the way for reading and even developing a large commercial operating system in the future.

The structure of the operating system kernel made by this graduation project is very simple, but although sparrow is small and full of five organs, it mainly includes the implementation of Loader, the construction of the whole kernel structure, process management, file management, memory management. Multi-console input-output system management. By using the command line user interaction mode and the system call designed by calling, the simple command of echo Pwd and the input and output interaction of keyboard are completed.

In this paper, the basic knowledge and main functions of the operating system are introduced, and then the protection mode of IA32 based on X86 architecture is analyzed and studied. Then the operating system development tools, running environment and the language used are briefly described, and then the principle of the kernel implementation of the operating system and its specific design and implementation are described. Finally, the system calls designed will be called. Complete the basic command with keyboard control function.

Keywords: Kernel ；Operating system ；IA32bit Protect Mode；Simple shell

第1章 绪论

1.1 选题背景和意义

在计算机高速发展的今天，挑选自己喜欢的配件来组装一台个性化的PC对我们来说已经不困难了。不仅如此，只要有合适的编译环境，我们可以自己制作游戏、APP、网页等。但是作为软件与硬件桥梁的操作系统，却很少有人会去做，因为一个可用的商用的操作系统所需要的不仅仅是一个人的聪明才智，更需要的是一个操作系统的生态系统[1]