<<计算机系统设计原理>>

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内容概要

本书由计算机系统设计的权威专家、美国麻省理工学院Saltzer和Kaashoek教授编写。
本书是第一本阐述计算机系统设计中的基本原理和抽象的教材，是麻省理工开放式课程计划(MIT Open Courseware)中“计算机系统工程”课程的主教材。
计算机系统的基本原理横跨于操作系统、网络、数据库、分布式系统、程序设计语言、软件工程以及计算机体系结构等方面。
通过详细分析每个基本原理的案例，本书演示了如何应用这些原理和抽象来解决实际的计算机系统设计问题。
本书的重点是计算机系统的设计，因此，本书阐述了那些在实践中已证明是成功的抽象概念，如命令、远程过程调用、客户/服务器组织结构、文件系统、事务处理、修复复制、读/写一致性，以及认证与保密消息等概念。
这些抽象概念使得计算机系统设计者可以用功能日益强大的模块来构建计算机系统，保护计算机系统避免从意外的编程错误到恶意入侵在内的各种故障。
本书描述了如何实现这些抽象概念，演示了如何把它们应用于不同的系统，为读者日后的设计工作打下基础。

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作者简介

作者：(美国)萨特泽(Jerome H.Saltzer) (美国)卡肖克(M.Frans Kaashoek)Jerome H.Saltzer received the degree of Sc.D.in the field of ElectricaI Engineering in 1 966 from the Massachusetts Institute of Technology.Since 1966 he has been a faculty member in M.I.I.'s Department of ElectricaI Engineering and Computer Science，where he helped to formulate the original undergraduate curriculum in Computer Science.At the M.I.T Computer Science and ArtificiaI Intelligence Laboratory he designed one of the earliest widely-used wo rd..processing systems；he participated in the development of the Multics system，for which he designed the kerneI thread package and with students and colleagues developed the secu rity mechanisms and what would today be known as a microkernel ；together with David Clark and David Reed.he articulated the end-to-end argument.a key organizing principle of the Internet；and he was also involved in the design of a token.passing ring IocaI area network.the networking of personal computers，the Kerberos single login authentication system.and digital library systems.Professo r Saltzer was TechnicaI Director of M.I.T Project Athena.a system for undergraduate education and an ea rly example of a system of organization now called"cloud computing".Th roughout his work.he has had a particular interest in the impact of computer systems on privacy and the risks of depending on fragile technology.Professor Saltzer is a member of the NationaI Academy of Engineering.a Fellow of the IEEE and the AAAS，a member of the Association for Computing Machinery.the ACM Committee on Computers and Public Policy.the Catalog Raisonne Schola rs Association，a former member of the Computer Science and TelecommunicatiOns Board of the National Resea rch Council.and a former member of the Mayor's Telecommunications Advisory Board for the City of Newton.Massachusetts.M.Frans Kaashoek received his Ph.D.in 1992 from the Vriie Universiteit in Amsterdam.The Netherlands.fOr his work on g roup communication in the Amoeba distributed operating system ，under the supervision of A.S.Tanenbaum.Since 1 993 he has been a facuity member in M.I.T's Department of ElectricaI Enqineering and Compute r Science.where he and Professor Saltzer co-developed the core undergraduate subject on fhe design of computer systems.Professor Kaashoek is a membe r of the Computer Science and Artificial Intelligence Laboratory.whe re his principal field of inte rest is designing and building compute r systems.He co.1eads the paralleI and distributed operating systems group.His past research in collaboration with colleaques and students includes the exokernel operating system，the Click modular router,the RON overlay.the self.certifying file system，the Chord distributed hash table，and the Asbestos secure operating system.He also participated in starting two successfulIT companies.Professor Kaashoek is a member of the NationaI Academy of Engineering and the recipient of several awards.including the inaugural ACM SIGOPS Mark Weiser award for demonstrating creativity and innovation in operating systems research.

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章节摘录

插图：5.2.2 Sequence Coordination with a Bounded BufferThe implementation with bounded buffers requires coordination between sending and receiving threads because a thread may have to wait until buffer space is available or until a message arrives. Two quite different approaches to thread coordination have developed over the years by researchers in different fields. One approach, usually taken by operating system designers, assumes that the programmer is an all-knowing genius who makes no mistakes. The other approach, usually taken by database designers, assumes that the programmer is a mere mortal, so it provides strong automatic support for coordination correctness, but at some cost in flexibility.The next couple of subsections exhibit the genius approach to coordination, not because it is the best way to tackle coordination problems, but rather to give some intuition about why it requires a coordination genius, and thus should be subcontracted to such a specialist whenever possible. In addition, to implement the database approach the designer of the automatic coordination support approach must use the genius approach. Chapter 9 [on-line] uses the concepts introduced in this chapter to implement the database approach for mere mortals.

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