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Interrupt Handling Schemes in Operating Systems

 Springer

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Preface

Interrupts are signals that can be sent by hardware or software to indicate an event that needs immediate CPU attention. These events are usually connected to an I/O device, which mostly deals with the external world. The hardware of a computer system has many I/O device drivers and the interrupt mechanism in the operating system must help to identify and handle the interrupt request. Interrupts can also be caused by software, either due to an exceptional condition in the processor itself or a special instruction that causes an interrupt when executed.

In this book, the interrupt handling models used by several operating systems are introduced and compared. In Chap. 1, we begin with an introduction of the classic interrupt mechanism, its associated hardware, and the interrupt handling software. Chapter 2 focuses on the interrupt management models used by traditional operating systems, such as UNIX, and the Networked Operating Systems, Windows NT and Linux. Chapter 3 describes the schemes used in handling interrupts as threads. Two schemes are studied from this model: interrupt signals as interprocess communication events (IPC) and interrupts as kernel threads. Chapter 4 provides an overview of the interrupt management models used in embedded and real-time systems. Each model is analyzed and compared in terms of their temporal behavior, unpredictability, overheads priority interferences, and mutual exclusion problems. Finally, in Chap. 5 the interrupt handling architectures used in general purpose and real-time operating systems are described.

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Contents

1	Interrupts Mechanism	1
2	Interrupt Handling in Classic Operating Systems.	15
3	Handling of Interrupts as Threads	27
4	Interrupt Handling in Android	33
5	Treatment of Interrupts in Embedded and Real Time Systems.	37
6	Interrupt Handling Architectures	43
	References	51