

1. Record Nr.	UNINA9910830410003321
Autore	Laplante Phillip A
Titolo	Real-time systems design and analysis [[electronic resource] /] / Phillip A. Laplante
Pubbl/distr/stampa	Hoboken, N.J., : Wiley, 2004
ISBN	1-280-36809-8 9786610368099 0-470-34265-X 0-471-64828-0 0-471-64829-9
Edizione	[3rd ed.]
Descrizione fisica	1 online resource (529 p.)
Disciplina	001.6 004.33
Soggetti	Real-time data processing System design
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references (p. 475-485) and index.
Nota di contenuto	REAL-TIME SYSTEMS DESIGN AND ANALYSIS; CONTENTS; Preface to the Third Edition; 1 Basic Real-Time Concepts; 1.1 Terminology; 1.1.1 Systems Concepts; 1.1.2 Real-Time Definitions; 1.1.3 Events and Determinism; 1.1.4 CPU Utilization; 1.2 Real-Time System Design Issues; 1.3 Example Real-Time Systems; 1.4 Common Misconceptions; 1.5 Brief History; 1.5.1 Theoretical Advances; 1.5.2 Early Systems; 1.5.3 Hardware Developments; 1.5.4 Early Software; 1.5.5 Commercial Operating System Support; 1.6 Exercises; 2 Hardware Considerations; 2.1 Basic Architecture; 2.2 Hardware Interfacing; 2.2.1 Latching 2.2.2 Edge versus Level Triggered 2.2.3 Tristate Logic; 2.2.4 Wait States; 2.2.5 Systems Interfaces and Buses; 2.3 Central Processing Unit; 2.3.1 Fetch and Execute Cycle; 2.3.2 Microcontrollers; 2.3.3 Instruction Forms; 2.3.4 Core Instructions; 2.3.5 Addressing Modes; 2.3.6 RISC versus CISC; 2.4 Memory; 2.4.1 Memory Access; 2.4.2 Memory Technologies; 2.4.3 Memory Hierarchy; 2.4.4 Memory Organization; 2.5 Input/Output; 2.5.1 Programmed Input/Output; 2.5.2 Direct Memory Access; 2.5.3 Memory-Mapped Input/Output; 2.5.4 Interrupts; 2.6

Enhancing Performance; 2.6.1 Locality of Reference; 2.6.2 Cache
 2.6.3 Pipelining 2.6.4 Coprocessors; 2.7 Other Special Devices; 2.7.1
 Applications-Specific Integrated Circuits; 2.7.2 Programmable Array
 Logic/Programmable Logic Array; 2.7.3 Field-Programmable Gate
 Arrays; 2.7.4 Transducers; 2.7.5 Analog/Digital Converters; 2.7.6
 Digital/Analog Converters; 2.8 Non-von-Neumann Architectures; 2.8.1
 Parallel Systems; 2.8.2 Flynn's Taxonomy for Parallelism; 2.9 Exercises;
 3 Real-Time Operating Systems; 3.1 Real-Time Kernels; 3.1.1
 Pseudokernels; 3.1.2 Interrupt-Driven Systems; 3.1.3 Preemptive-
 Priority Systems; 3.1.4 Hybrid Systems
 3.1.5 The Task-Control Block Model 3.2 Theoretical Foundations of
 Real-Time Operating Systems; 3.2.1 Process Scheduling; 3.2.2 Round-
 Robin Scheduling; 3.2.3 Cyclic Executives; 3.2.4 Fixed-Priority
 Scheduling-Rate-Monotonic Approach; 3.2.5 Dynamic-Priority
 Scheduling: Earliest-Deadline-First Approach; 3.3 Intertask
 Communication and Synchronization; 3.3.1 Buffering Data; 3.3.2 Time-
 Relative Buffering; 3.3.3 Ring Buffers; 3.3.4 Mailboxes; 3.3.5 Queues;
 3.3.6 Critical Regions; 3.3.7 Semaphores; 3.3.8 Other Synchronization
 Mechanisms; 3.3.9 Deadlock; 3.3.10 Priority Inversion
 3.4 Memory Management 3.4.1 Process Stack Management; 3.4.2 Run-
 Time Ring Buffer; 3.4.3 Maximum Stack Size; 3.4.4 Multiple-Stack
 Arrangements; 3.4.5 Memory Management in the Task-Control-Block
 Model; 3.4.6 Swapping; 3.4.7 Overlays; 3.4.8 Block or Page
 Management; 3.4.9 Replacement Algorithms; 3.4.10 Memory Locking;
 3.4.11 Working Sets; 3.4.12 Real-Time Garbage Collection; 3.4.13
 Contiguous File Systems; 3.4.14 Building versus Buying Real-Time
 Operating Systems; 3.4.15 Selecting Real-Time Kernels; 3.5 Case Study:
 POSIX; 3.5.1 Threads; 3.5.2 POSIX Mutexes and Condition Variables
 3.5.3 POSIX Semaphores

Sommario/riassunto

The leading guide to real-time systems design-revised and
 updatedThis third edition of Phillip Laplante's bestselling, practical
 guide to building real-time systems maintains its predecessors' unique
 holistic, systems-based approach devised to help engineers write
 problem-solving software. Dr. Laplante incorporates a survey of related
 technologies and their histories, complete with time-saving practical
 tips, hands-on instructions, C code, and insights into decreasing ramp-
 up times.Real-Time Systems Design and Analysis, Third Edition is
 essential for students and practicing sof