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Engineering : Communications Engineering, Networks

Schagaev, I., Zouev, E., Thomas, K.

Software Design for Resilient Computer Systems

- Outlines potential critical faults in the modern computer systems and what is required to change them
- Explains how to design system software for next generation computers with wider applications and greater efficiency
- Presents how implemented system software support makes maintenance easier, while reliability and performance increase
- With new chapters on computer system performance, resilience and resilient architecture simulators and system software

This book addresses the question of how system software should be designed to account for faults, and which fault tolerance features it should provide for highest reliability. With this second edition of *Software Design for Resilient Computer Systems* the book is thoroughly updated to contain the newest advice regarding software resilience. With additional chapters on computer system performance and system resilience, as well as online resources, the new edition is ideal for researchers and industry professionals. The authors first show how the system software interacts with the hardware to tolerate faults. They analyze and further develop the theory of fault tolerance to understand the different ways to increase the reliability of a system, with special attention on the role of system software in this process. They further develop the general algorithm of fault tolerance (GAFT) with its three main processes: hardware checking, preparation for recovery, and the recovery procedure. For each of the three processes, they analyze the requirements and properties theoretically and give possible implementation scenarios and system software support required. Based on the theoretical results, the authors derive an Oberon-based programming language with direct support of the three processes of GAFT.

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