Data storage architectures and technologies

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Data is a core asset in the current development of information technology and needs to be stored efficiently and reliably to serve many important real-world applications such as the Internet, big data, artificial intelligence, and high-performance computing. Generations of researchers and practitioners have continued to innovate the design of storage systems to achieve the goals of high performance, ease of use, and high reliability. This textbook provides a thorough and comprehensive introduction to the field of data storage. With 14 chapters, the book not only covers the basics of storage devices, storage arrays, storage protocols, key-value stores, file systems, network storage architecture, distributed storage systems, storage reliability, storage security, and data protection, but also provides in-depth discussions on advanced topics such as storage maintenance, storage solutions, and storage technology trends and developments (e.g., in-storage computing, persistent memory system, blockchain storage, and in-network storage system). For each section, the authors have attempted to provide the latest current academic and industry research progress that will help readers deepen their understanding and application of basic data storage concepts. This textbook is ideal for storage courses targeting upper-level undergraduate or graduate students in computer science and related disciplines. It also serves as a valuable reference for technical professionals