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Autore	Li Hui
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Nota di contenuto

Cover -- Series Page -- Title Page -- Copyright Page -- Contents -- Foreword by Peter Major -- Foreword by Zhang Jing-an -- Foreword by Yale Li -- Foreword by Feng Han -- Foreword by Ramesh Ramadoss -- About the Author -- Preface -- Acknowledgments -- Introduction -- Chapter 1 Fundamentals of Blockchain -- 1.1 Introduction to Blockchain -- 1.2 Evolution of Blockchain -- 1.2.1 Value Evolution in Blockchain Applications -- 1.2.2 Blockchain Underlying Platform -- 1.2.2.1 Public Blockchain -- 1.2.2.2 Consortium Blockchain -- 1.2.2.3 Blockchain as a Service -- 1.2.3 Blockchain Security, Regulation, and Governance -- 1.2.3.1 Security -- 1.2.3.2 Regulation -- 1.2.3.3 Governance -- 1.3 Blockchain-Layered Architecture

-- 1.3.1 Physical Layer -- 1.3.2 Data Layer -- 1.3.3 Network Layer

Sommario/riassunto

Technical theory, key technologies, and practical applications for consortium blockchains, with a solution to the CAP trilemma problem Principles and Applications of Blockchain Systems provides a comprehensive introduction to consortium blockchains, including the physical, network, consensus, and contract layers, covering technical theory, key technologies, and practical applications. Beyond the technical side, this book visually showcases the application potential of consortium blockchains, with information on implementation cases in network management (Multi-Identifier System) and secure storage (Mimic Distributed Storage System). This book thoroughly addresses the CAP trilemma problem for consortium blockchains, a major barrier to scalability, by presenting a novel quantifiable impossibility triangle with a solution. Additionally, optimization techniques in consortium blockchains, such as P2P protocols for future networks and consensus algorithms, are discussed in detail. Written by two highly qualified academics with significant experience in the field, Principles and Applications of Blockchain Systems discusses topics such as: * Peer-to-peer networks in consortium blockchains, covering P2P network architecture and node discovery, data synchronization, and gossip protocols * Basic concepts of distributed consistency, including the SMR model in blockchain systems, assumptions for distributed networks, and the Byzantine Generals problem * Consensus mechanisms evolution process from voting-based, including PBFT, RPCA, SCP, and CoT; to proof-based including PoW, PoS, and PoX; finally optimized by fusion both voting-based and proof-based, including PoV, PPoV, HotStuff * Types of vulnerability for smart contracts, covering solidity code, EVM execution, and blockchain system layers * Historical trend of upgrade from electronic consensus to quantum consensus With highly comprehensive coverage of the subject, Principles and Applications of Blockchain Systems serves as an ideal textbook for blockchain students and researchers, and a valuable reference book for engineers and business leaders involved in developing real-world blockchain systems.