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Titolo	Introducing blockchain applications : understand and develop blockchain applications through distributed systems // Joseph Thachil George
Pubbl/distr/stampa	New York, New York : , : Apress, , [2022] ©2022
ISBN	1-4842-7480-6
Descrizione fisica	1 online resource (462 pages)
Disciplina	005.74
Soggetti	Blockchains (Databases)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	1: Introducing Blockchain Applications Through Distributed Systems -- 2: Introduction to Blockchain -- 3: Bitcoin -- 4: Ethereum -- 5: Proof of Stake: Consensus of the Future -- 6: Hyperledger Fabric -- 7: Consensus Algorithms for Blockchains -- 8: Sample Project Exercise: Consensus Algorithms for Blockchains -- 9: Real-Time Systems -- 10: Scheduling in Real-Time Systems -- 11: Engineering Based on Models -- 12: Blockly 4 SOS -- 13: Project: Cyber Physical Systems -- 14: Project Using MATLAB: Smart Farm -- 15: Platoon Project -- 16: Blockchain Technology and Distributed Systems Future Scope and B-Coin Project -- 17: AI and Blockchain: Monitoring Autonomous Vehicles Management Project -- 18: Summary.
Sommario/riassunto	Deepen your understanding of blockchain technology and develop your own blockchain applications. This book provides a thorough review of distribution-based systems on blockchain technology, starting from the fundamental concepts that underlie it, all the way through the implementation of a blockchain network for business purposes. Author Joseph Thachil George begins by introducing you to blockchain and some basic concepts of technology, including distributed systems, systems of systems, cyber-physical systems, the Byzantine Consensus, the CAP theorem, and cryptographic techniques. Next, he analyzes the structure of blocks and smart contracts and the mother of all blockchain platforms, Bitcoin. That sets the stage for an examination of

transaction structure, validation, and flow, from creation to registration in the ledger and structure of the blocks, the Nakamoto consensus, and finally forks. From there, you'll experience a deep dive into Ethereum; including the concepts of Gas and Message, smart contracts and the Ethereum virtual machine. From there, you'll learn about the Ethereum consensus protocol, Ethereum Casper, and the Ethereum Proof-of-Stake algorithm. You'll then see how blockchain can be connected to a distributed system, followed by a demonstration of how you can model a distributed system using Blockly4SoS and Kilobots. The concluding chapters offer a practical example that combines distributed systems with blockchain technology. After reading this book, you will understand how to implement blockchain technology in a distributed system and be able to leverage this knowledge in your own projects.

You will:

- Learn the concept of blockchains by way of a practical example
- Grasp the connection between distributed systems and blockchain technology
- Learn the design of blockchain with hyperledger fabric
- Learn the design of cyber-physical systems in a distributed environment
