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Descrizione fisica	1 online resource (683 pages)
Disciplina	690.028/6
Soggetti	Carbon dioxide mitigation - Technological innovations Buildings - Energy consumption Buildings - Energy conservation Automation - Environmental aspects
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Sommario/riassunto	Complete, up-to-date reference on system architecture for building energy management systems Automating Building Energy Management for Accelerated Building Decarbonization delivers detailed technical information on building energy management control technology and guidelines to implementing and deploying building energy management systems. The book provides a detailed look at the system architecture of cloud-based building energy management systems, and a comprehensive review of technology for the networking layer, from the link layer through the application layer. Wired and wireless link layer protocols, and Internet network layer protocols from the TCP/IP suite are thoroughly reviewed, and discussed in the context of deploying an in-building, operational technology network. At the

application layer, BACnet, for large commercial and government buildings, and Bluetooth Low Energy, Zigbee, and Matter, for smaller commercial and residential buildings, are discussed in detail, with focus on energy management and building decarbonization. The API standards OpenAPI 3.1 and AsyncAPI 3.0 are used to define example APIs for controlling an HVAC system, illustrating how to provide API abstractions that simplify the development of building energy management applications and services. Finally, a discussion of controlling onsite distributed energy resources, such as solar panels and on-site battery storage, through SunSpec Modbus, and communicating with the utility through OpenADR and IEEE 2030.5 provide a solid technical foundation for implementing communication services in demand response and flexible load applications. Security is emphasized as a key property for the operational technology networks that run building energy systems up and down the stack. At the architectural level, security functions including data origin authentication, confidentiality protection, and key exchange are discussed in detail. Detailed information on security protocols including IPsec at the network layer, TLS at the transport layer, and OAuth2.0 at the application layer is presented. In addition, advice on deploying security solutions in building energy management networks is provided. Throughout the book, QR codes provide access to short videos about topics where more depth is needed or that are only briefly covered. These allow the reader to view more information about important topics. Automating Building Energy Management for Accelerated Building Decarbonization is an essential resource for managers, engineers, and other professionals involved in designing and building energy management services for commercial and residential buildings. It is also an excellent reference for university and training courses related to building decarbonization and renewable energy.
