
Edge Computing For Iot Applications Motivations

What is edge computing? What is edge computing? Why Edge Computing and IoT Is Still Important? Edge Devices and Blockchain Integration in IoT Applications: A Novel Design Approach Webinar - Edge-Based Generative AI for IoT Applications What is edge computing and how can it help your applications? The Future of IoT: Exploring Edge Computing for Embedded Systems in 2023 and Beyond. Internet-of-Things (IoT): Edge Computing Implementation Edge Computing - Advantages for industrial IoT applications How to manage a farm of robots using Azure IoT \u0026amp; Digital Twins RP Book Discussion - Shaping the Future of IoT with Edge Intelligence Hands on with Edge Computing for IoT Edge Computing Tutorials: Mapping an IoT peripheral device to your container application Edge Computing and Cloud Computing | Edge Computing Explanation Mastering Edge Computing for Real-Time Applications Edge Computing with AWS IoT What is Edge AI? | What is edge computing? The Application of Open Source Technologies to IoT and Edge Computing Edge Computing With Smart Cities IoT and Edge Computing: What You Need to Know | Sunlight.io's Julian Chesterfield IoT and Edge Computing for Architects Edge Computing Simply In Depth Industrial IoT - EDGE COMPUTING VENDORS Overview Fundamentals, Design and Applications Principles and Paradigms Edge Computing Challenges and Opportunities for the Convergence of IoT, Big Data, and Cloud Computing Fog/Edge Computing For Security, Privacy, and Applications Handbook of Research on Cloud and Fog Computing Infrastructures for Data Science Edge Computing Intelligent IoT for the Digital World Fog Computing in the Internet of Things The role of Artificial Intelligence and distributed computing in IoT applications Applications, Challenges and Enablers

Fog and Edge Computing

From Data to Insight

Blockchain-enabled Fog and Edge Computing: Concepts, Architectures and Applications

*Edge Computing For Iot Applications
Motivations*

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IoT and Edge Computing for Architects IGI Global

This exciting book explores the past, present and future of IoT, presenting the most prominent technologies that comprise IoT applications, including cloud computing, edge computing, embedded computing, Big Data, Artificial Intelligence (AI), blockchain and cybersecurity. A comprehensive description of the full range of the building blocks that comprise emerging IoT systems and applications is provided, while illustrating the evolution of IoT systems from the legacy small scale sensor systems and wireless sensor networks, to today's large scale IoT deployments that comprise millions of connected devices in the cloud and smart objects with (semi)autonomous behavior. It also provides an outlook for the future evolution of IoT systems, based on their blending with AI and the use of emerging technologies like blockchain for massively decentralized applications. The full spectrum of technologies that are closely associated with the term IoT since its introduction are explored. The book also highlights the main challenges that are associated with the development and deployment of IoT applications at scale, including network connectivity, security, and interoperability challenges. First tech sensors, wireless sensor networks and

radio-frequency identification (RFID) tags are covered. Machine learning, big data and security issues are also explored.

Edge Computing Simply In Depth CRC Press

Learn to design, implement, and secure your IoT infrastructure. Revised and expanded for edge computing. Key Features Build a complete IoT system that's the best fit for your organization Learn about different concepts, tech, and trade-offs in the IoT architectural stack Understand the theory and implementation of each element that comprises IoT design Book Description Industries are embracing IoT technologies to improve operational expenses, product life, and people's well-being. An architectural guide is needed if you want to traverse the spectrum of technologies needed to build a successful IoT system, whether that's a single device or millions of IoT devices. IoT and Edge Computing for Architects, Second Edition encompasses the entire spectrum of IoT solutions, from IoT sensors to the cloud. It examines modern sensor systems, focusing on their power and functionality. It also looks at communication theory, paying close attention to near-range PAN, including the new Bluetooth® 5.0 specification and mesh networks. Then, the book explores IP-based communication in LAN and WAN, including 802.11ah, 5G LTE cellular, Sigfox, and LoRaWAN. It also explains edge computing, routing and gateways, and their role in fog computing, as well as the messaging protocols of MQTT 5.0 and CoAP. With the data now in internet form, you'll get an

understanding of cloud and fog architectures, including the OpenFog standards. The book wraps up the analytics portion with the application of statistical analysis, complex event processing, and deep learning models. The book then concludes by providing a holistic view of IoT security, cryptography, and shell security in addition to software-defined perimeters and blockchains. What you will learn Understand the role and scope of architecting a successful IoT deployment Scan the landscape of IoT technologies, from sensors to the cloud and more See the trade-offs in choices of protocols and communications in IoT deployments Become familiar with the terminology needed to work in the IoT space Broaden your skills in the multiple engineering domains necessary for the IoT architect Implement best practices to ensure reliability, scalability, and security in your IoT infrastructure Who this book is for This book is for architects, system designers, technologists, and technology managers who want to understand the IoT ecosystem, technologies, and trade-offs, and develop a 50,000-foot view of IoT architecture. An understanding of the architectural side of IoT is necessary.

Industrial IoT - EDGE COMPUTING VENDORS Overview Springer

In today's market, emerging technologies are continually assisting in common workplace practices as companies and organizations search for innovative ways to solve modern issues that arise. Prevalent applications including internet of things, big data, and cloud computing all have noteworthy benefits, but issues remain when separately integrating them into the professional practices. Significant research is needed on converging these systems and leveraging each of their

advantages in order to find solutions to real-time problems that still exist. Challenges and Opportunities for the Convergence of IoT, Big Data, and Cloud Computing is a pivotal reference source that provides vital research on the relation between these technologies and the impact they collectively have in solving real-world challenges. While highlighting topics such as cloud-based analytics, intelligent algorithms, and information security, this publication explores current issues that remain when attempting to implement these systems as well as the specific applications IoT, big data, and cloud computing have in various professional sectors. This book is ideally designed for academicians, researchers, developers, computer scientists, IT professionals, practitioners, scholars, students, and engineers seeking research on the integration of emerging technologies to solve modern societal issues.

FUNDAMENTALS, DESIGN AND APPLICATIONS

Challenges and Opportunities for the Convergence of IoT, Big Data, and Cloud Computing

Fog is starting to shape the future of the balance of power in information technology The book examines how fog will change the information technology industry in the next decade. Along the cloud-to-things continuum, fog distributes the services of computation, communication, control, and storage closer to the edge, access, and users. As a computing and networking architecture, fog enables key applications in wireless 5G, the Internet of things (IoT), and big data. The authors cover the fundamental trade-offs to major applications of fog. The book chapters are designed to motivate a transition from the current

cloud architectures to the fog (Chapter 1) and the necessary architectural components to support such a transition (Chapters 2-6). The rest of the chapters (Chapters 7-11) are dedicated to reviewing various 5G and IoT applications that will benefit from fog networking. This volume is edited by pioneers in fog and includes contributions by active researchers in the field. Covers fog technologies and describes the interaction between fog and cloud. Presents a view of fog and IoT that combines the aspects of both industry and academia. Discusses the various architectural and design challenges in coordinating the interactions between M2M, D2D, and fog technologies. "Fog for 5G and IoT" serves as an introduction to the evolving fog architecture, compiling work from different areas that collectively form this paradigm.

PRINCIPLES AND PARADIGMS

Morgan & Claypool Publishers

This novel textbook introduces Enterprise Internet of Things from technology, management and business perspectives, carefully examining enterprise environments through the lens of modernization with the Internet of Things (IoT). It also includes detailed case studies to offer meaningful insights for readers from various disciplines and areas. The book analyzes the ways in which the technology could contribute to the enterprise world in terms of revenue and new business models, and addresses the strategies and principles involved in developing IoT solutions with software engineering practices such as DevOps and Microservices architecture principles. By doing so, it offers readers a clear overview of the power of Internet of Things in building next generation enterprise use cases. The book enables readers to

understand the latest opportunities to create new business models in enterprises using the unprecedented level of device connectivity, and the wealth of data generated and information exchange among these devices. As such, it appeals to various user groups, such as engineers trying to solve problems in their own domains using Enterprise IoT, academics interested in gaining a better understanding of applications of IoT in large-scale enterprises, and researchers wanting to contribute to the ever-growing and complex area of IoT.

Edge Computing John Wiley & Sons

Discover how the Internet of Things will change the information and communication technology industry in the next decade. The Intelligent Internet of Things explores a unique type of Internet of Things (IoT) architecture, for example, the Web of Things (WoT) with its open character that breaks the barriers among various IoT vertical applications. The authors—noted experts on the topic—examine and compare key technologies from physical to platform level, especially the Narrow Band Internet of Things (NB-IoT) technology. They discuss applications with different data transmission requirements that are typical to IoT. The text also describes the requirements of WoT applications on 5G and includes detailed information on WoT technologies. The Intelligent Internet of Things examines three typical WoT applications: the monitoring application of south-to-north water diversion projects; smart driving applications; and network optimization applications. In addition, the text explores testing and authentication of IoT key technologies, with the required equipment, platform, and outdoor environment development. This important book: Provides information on what IoT/WoT is,

when to use it, how to provide IoT services with certain technologies, and more Discusses restful architecture, main protocols (ZigBee, 6lowpan, CoAP, HTML5) Explores key technologies on different layers (sensing, gathering, application) Examines how IoT will change the information and communication technology industry Written for professionals working in IoT development, management and big data analytics, Intelligent Internet of Things offers an overview of IoT architecture, key technology, current applications and future development of the technology.

Challenges and Opportunities for the Convergence of IoT, Big Data, and Cloud Computing Wiley

As more and more devices become interconnected through the Internet of Things (IoT), there is an even greater need for this book, which explains the technology, the internetworking, and applications that are making IoT an everyday reality. The book begins with a discussion of IoT "ecosystems" and the technology that enables them, which includes: Wireless Infrastructure and Service Discovery Protocols Integration Technologies and Tools Application and Analytics Enablement Platforms A chapter on next-generation cloud infrastructure explains hosting IoT platforms and applications. A chapter on data analytics throws light on IoT data collection, storage, translation, real-time processing, mining, and analysis, all of which can yield actionable insights from the data collected by IoT applications. There is also a chapter on edge/fog computing. The second half of the book presents various IoT ecosystem use cases. One chapter discusses smart airports and highlights the role of IoT integration. It explains how mobile devices, mobile technology, wearables, RFID

sensors, and beacons work together as the core technologies of a smart airport. Integrating these components into the airport ecosystem is examined in detail, and use cases and real-life examples illustrate this IoT ecosystem in operation. Another in-depth look is on envisioning smart healthcare systems in a connected world. This chapter focuses on the requirements, promising applications, and roles of cloud computing and data analytics. The book also examines smart homes, smart cities, and smart governments. The book concludes with a chapter on IoT security and privacy. This chapter examines the emerging security and privacy requirements of IoT environments. The security issues and an assortment of surmounting techniques and best practices are also discussed in this chapter.

Fog/Edge Computing For Security, Privacy, and Applications Packt Publishing Ltd

This reference text presents the state-of-the-art in edge computing, its primitives, devices and simulators, applications, and healthcare-based case studies. The text provides integration of blockchain with edge computing systems and integration of edge with Internet of Things (IoT) and cloud computing. It will facilitate readers to setup edge-based environment and work with edge analytics. It covers important topics, including cluster computing, fog computing, networking architecture, edge computing simulators, edge analytics, privacy-preserving schemes, edge computing with blockchain, autonomous vehicles, and cross-domain authentication. Aimed at senior undergraduate, graduate students and professionals in the fields of electrical engineering, electronics engineering, computer science, and information technology, this text: Discusses edge data storage

security with case studies and blockchain integration with the edge computing system Covers theoretical methods with the help of applications, use cases, case studies, and examples Provides healthcare real-time case studies elaborated by utilizing the virtues of homomorphic encryption Discusses real-time interfaces, devices, and simulators in detail

Handbook of Research on Cloud and Fog Computing Infrastructures for Data Science IGI Global

LEARN MORE ABOUT FOUNDATIONAL AND ADVANCED TOPICS IN INTERNET OF THINGS TECHNOLOGY WITH THIS ALL-IN-ONE GUIDE

Enabling the Internet of Things: Fundamentals, Design, and Applications delivers a comprehensive starting point for anyone hoping to understand the fundamentals and design of Internet of Things (IoT) systems. The book's distinguished academics and authors offer readers an opportunity to understand IoT concepts via programming in an abstract way. Readers will learn about IoT fundamentals, hardware and software components, IoT protocol stacks, security, IoT applications and implementations, as well as the challenges, and potential solutions, that lie ahead. Readers will learn about the social aspects of IoT systems, as well as receive an introduction to the Blockly Programming Language, IoT Microcontrollers, IoT Microprocessors, systems on a chip and IoT Gateway Architecture. The book also provides implementation of simple code examples in Packet Tracer, increasing the usefulness and practicality of the book. Enabling the Internet of Things examines a wide variety of other essential topics, including: The fundamentals of IoT, including its evolution, distinctions, definitions, vision, enabling technologies, and building blocks An elaboration of the sensing principles of IoT and

the essentials of wireless sensor networks A detailed examination of the IoT protocol stack for communications An analysis of the security challenges and threats faced by users of IoT devices, as well as the countermeasures that can be used to fight them, from the perception layer to the application layer Perfect as a supplementary text for undergraduate students taking computer science or electrical engineering courses, Enabling the Internet of Things also belongs on the bookshelves of industry professionals and researchers who regularly work with and on the Internet of Things and who seek a better understanding of its foundational and advanced topics.

Edge Computing IGI Global

Summarizes the current state and upcoming trends within the area of fog computing Written by some of the leading experts in the field, Fog Computing: Theory and Practice focuses on the technological aspects of employing fog computing in various application domains, such as smart healthcare, industrial process control and improvement, smart cities, and virtual learning environments. In addition, the Machine-to-Machine (M2M) communication methods for fog computing environments are covered in depth. Presented in two parts—Fog Computing Systems and Architectures, and Fog Computing Techniques and Application—this book covers such important topics as energy efficiency and Quality of Service (QoS) issues, reliability and fault tolerance, load balancing, and scheduling in fog computing systems. It also devotes special attention to emerging trends and the industry needs associated with utilizing the mobile edge computing, Internet of Things (IoT), resource and pricing estimation, and virtualization in the fog environments. Includes

chapters on deep learning, mobile edge computing, smart grid, and intelligent transportation systems beyond the theoretical and foundational concepts Explores real-time traffic surveillance from video streams and interoperability of fog computing architectures Presents the latest research on data quality in the IoT, privacy, security, and trust issues in fog computing Fog Computing: Theory and Practice provides a platform for researchers, practitioners, and graduate students from computer science, computer engineering, and various other disciplines to gain a deep understanding of fog computing.

Intelligent IoT for the Digital World John Wiley & Sons
In this book, contributors provide insights into the latest developments of Edge Computing/Mobile Edge Computing, specifically in terms of communication protocols and related applications and architectures. The book provides help to Edge service providers, Edge service consumers, and Edge service developers interested in getting the latest knowledge in the area. The book includes relevant Edge Computing topics such as applications; architecture; services; inter-operability; data analytics; deployment and service; resource management; simulation and modeling; and security and privacy. Targeted readers include those from varying disciplines who are interested in designing and deploying Edge Computing. Features the latest research related to Edge Computing, from a variety of perspectives; Tackles Edge Computing in academia and industry, featuring a variety of new and innovative operational ideas; Provides a strong foundation for researchers to advance further in the Edge Computing domain.

Fog Computing in the Internet of Things Springer Nature

The rapid advance of Internet of Things (IoT) technologies has resulted in the number of IoT-connected devices growing exponentially, with billions of connected devices worldwide. While this development brings with it great opportunities for many fields of science, engineering, business and everyday life, it also presents challenges such as an architectural bottleneck – with a very large number of IoT devices connected to a rather small number of servers in Cloud data centers – and the problem of data deluge. Edge computing aims to alleviate the computational burden of the IoT for the Cloud by pushing some of the computations and logics of processing from the Cloud to the Edge of the Internet. It is becoming commonplace to allocate tasks and applications such as data filtering, classification, semantic enrichment and data aggregation to this layer, but to prevent this new layer from itself becoming another bottleneck for the whole computing stack from IoT to the Cloud, the Edge computing layer needs to be capable of implementing massively parallel and distributed algorithms efficiently. This book, *Advances in Edge Computing: Massive Parallel Processing and Applications*, addresses these challenges in 11 chapters. Subjects covered include: Fog storage software architecture; IoT-based crowdsourcing; the industrial Internet of Things; privacy issues; smart home management in the Cloud and the Fog; and a cloud robotic solution to assist medical applications. Providing an overview of developments in the field, the book will be of interest to all those working with the Internet of Things and Edge computing.

The role of Artificial Intelligence and distributed computing in IoT applications CRC Press

This book describes state-of-the-art approaches to Fog Computing, including the background of innovations achieved in recent years. Coverage includes various aspects of fog computing architectures for Internet of Things, driving reasons, variations and case studies. The authors discuss in detail key topics, such as meeting low latency and real-time requirements of applications, interoperability, federation and heterogeneous computing, energy efficiency and mobility, fog and cloud interplay, geo-distribution and location awareness, and case studies in healthcare and smart space applications.

Applications, Challenges and Enablers Springer Nature
A comprehensive guide to Fog and Edge applications, architectures, and technologies Recent years have seen the explosive growth of the Internet of Things (IoT): the internet-connected network of devices that includes everything from personal electronics and home appliances to automobiles and industrial machinery. Responding to the ever-increasing bandwidth demands of the IoT, Fog and Edge computing concepts have developed to collect, analyze, and process data more efficiently than traditional cloud architecture. Fog and Edge Computing: Principles and Paradigms provides a comprehensive overview of the state-of-the-art applications and architectures driving this dynamic field of computing while highlighting potential research directions and emerging technologies. Exploring topics such as developing scalable architectures, moving from closed systems to open systems, and ethical issues rising from data sensing, this timely book addresses both the challenges and opportunities that Fog and Edge computing presents. Contributions from leading IoT experts discuss

federating Edge resources, middleware design issues, data management and predictive analysis, smart transportation and surveillance applications, and more. A coordinated and integrated presentation of topics helps readers gain thorough knowledge of the foundations, applications, and issues that are central to Fog and Edge computing. This valuable resource: Provides insights on transitioning from current Cloud-centric and 4G/5G wireless environments to Fog Computing Examines methods to optimize virtualized, pooled, and shared resources Identifies potential technical challenges and offers suggestions for possible solutions Discusses major components of Fog and Edge computing architectures such as middleware, interaction protocols, and autonomic management Includes access to a website portal for advanced online resources Fog and Edge Computing: Principles and Paradigms is an essential source of up-to-date information for systems architects, developers, researchers, and advanced undergraduate and graduate students in fields of computer science and engineering.

Fog and Edge Computing John Wiley & Sons

This book presents state-of-the-art research on security and privacy- preserving for IoT and 5G networks and applications. The accepted book chapters covered many themes, including traceability and tamper detection in IoT enabled waste management networks, secure Healthcare IoT Systems, data transfer accomplished by trustworthy nodes in cognitive radio, DDoS Attack Detection in Vehicular Ad-hoc Network (VANET) for 5G Networks, Mobile Edge-Cloud Computing, biometric authentication systems for IoT applications, and many other applications It aspires to provide a relevant reference for

students, researchers, engineers, and professionals working in this particular area or those interested in grasping its diverse facets and exploring the latest advances on security and privacy-preserving for IoT and 5G networks.

From Data to Insight CRC Press

"This book provides a practical approach to edge computing and analytics, its architecture and the building blocks for edge computing implementations. It address many characteristics of edge computing, such as key drivers for implementation, computing capabilities, use-cases, etc. case studies "--

BLOCKCHAIN-ENABLED FOG AND EDGE COMPUTING: CONCEPTS, ARCHITECTURES AND APPLICATIONS

John Wiley & Sons

As the Internet of Things proliferates, businesses face a growing need to analyse data from sources at the edge of a network, whether IoT devices, gateways, or IoT sensors. Edge computing provides new possibilities in IoT applications. Edge computing delivers tangible value in both consumer and industrial IoT use cases. That's why there are huge opportunities for vendors at all levels of the technology stack.

Connectivity and Edge Computing in IoT: Customized Designs and AI-based Solutions IGI Global

Edge computing and analytics are fascinating the whole world of computing. Industry and business are keenly embracing this sound concept to develop customer-centric solutions by enhancing their operations, offerings, and outputs. There is a bevy of advancements in this domain that came with the arrival of IoT devices. The seamless convergence of microservices and

serverless computing creates vast opportunities. With the help of IoT devices and these other developments, there has become a deep interest in business automation and additional improvisations in edge computing. With the steady growth of edge devices and applications of IoT fog/edge computing and analytics, there are also distinct challenges and threats. Research has been keenly focused on identifying and understanding these issues and shortcomings to bring viable solution approaches and algorithms. Cases on Edge Computing and Analytics describes the latest innovations, improvements, and transformations happening with edge devices and computing. It addresses the key concerns of the edge computing paradigm, how they are processed, and the various technologies and tools empowering edge computing and analytics. While highlighting topics within edge computing such as the key drivers for implementation, computing capabilities, security considerations, and use-cases, this book is ideal for IT industry professionals and project managers, computer scientists, computer engineers, and practitioners, stakeholders, researchers, academicians, and students looking for research on the latest trends and transitions in edge computing.

Implementing edge and IoT systems from sensors to clouds with communication systems, analytics, and security, 2nd Edition Engineering Science Reference

The Internet of Things (IoT) computing paradigm has connected smart objects "things" and has brought new services at the proximity of the user. Edge Computing, a natural evolution of the traditional IoT, has been proposed to deal with the ever-increasing (i) number of IoT devices and (ii) the amount of data

traffic that is produced by the IoT endpoints. EC promises to significantly reduce the unwanted latency that is imposed by the multi-hop communication delays and suggests that instead of uploading all the data to the remote cloud for further processing, it is beneficial to perform computation at the "edge" of the network, close to where the data is produced. However, bringing computation at the edge level has created numerous challenges as edge devices struggle to keep up with the growing application requirements (e.g. Neural Networks, or video-based analytics). In this thesis, we adopt the EC paradigm and we aim at addressing the open challenges. Our goal is to bridge the performance gap that is caused by the increased requirements of the IoT applications with respect to the IoT platform capabilities and provide latency- and energy-efficient computation at the edge level. Our first step is to study the performance of IoT applications that are based on Deep Neural Networks (DNNs). The exploding need to deploy DNN-based applications on resource-constrained edge devices has created several challenges, mainly due to the complex nature of DNNs. DNNs are becoming deeper and wider in order to fulfill users expectations for high accuracy, while they also become power hungry. For instance, executing a DNN on an edge device can drain the battery within minutes. Our solution to make DNNs more energy and inference friendly is to propose hardware-aware method that re-designs a given DNN architecture. Instead of proxy metrics, we measure the DNN performance on real edge devices and we capture their energy and inference time. Our method manages to find alternative DNN architectures that consume up to 78.82% less energy and are up to 35.71% faster than the reference networks. In order to achieve

end-to-end optimal performance, we also need to manage the edge device resources that will execute a DNN-based application. Due to their unique characteristics, we distinguish the edge devices into two categories: (i) a neuromorphic platform that is designed to execute Spiking Neural Networks (SNNs), and (ii) a general-purpose edge device that is suitable to host a DNN. For the first category, we train a traditional DNN and then we convert it to a spiking representation. We target the SpiNNaker neuromorphic platform and we develop a novel technique that efficiently configures the platform-dependent parameters, in order to achieve the highest possible SNN accuracy. Experimental results show that our technique is 2.5× faster than an exhaustive approach and can reach up to 0.8% higher accuracy compared to a CPU-based simulation method. Regarding the general-purpose edge devices, we show that a DNN-unaware platform can result in sub-optimal DNN performance in terms of power and inference time. Our approach configures the frequency of the device components (GPU, CPU, Memory) and manages to achieve average of 33.4% and up to 66.3% inference time improvements and an average of 42.8% and up to 61.5% power savings compared to the predefined configuration of an edge device. The last part of this thesis is the offloading optimization between the edge devices and the gateway. The offloaded tasks create contention effects on gateway, which can lead to application slowdown. Our proposed solution configures (i) the number of application stages that are executed on each edge device, and (ii) the achieved utility in terms of Quality of Service (QoS) on each edge device. Our technique manages to (i) maximize the overall QoS, and (ii) simultaneously satisfy network constraints

(bandwidth) and user expectations (execution time). In case of multi-gateway deployments, we tackled the problem of unequal workload distribution. In particular, we propose a workload-aware management scheme that performs intra- and inter-gateway optimizations. The intra-gateway mechanism provides a balanced execution environment for the applications, and it achieves up to 95% performance deviation improvement, compared to un-optimized systems. The presented inter-gateway method manages to balance the workload among multiple gateways and is able to achieve a global performance threshold.

FOG FOR 5G AND IoT

Ediciones Universidad de Salamanca

This book provides the state-of-the-art development on security and privacy for fog/edge computing, together with their system architectural support and applications. This book is organized into five parts with a total of 15 chapters. Each area corresponds to an important snapshot. The first part of this book presents an overview of fog/edge computing, focusing on its relationship with cloud technology and the future with the use of 5G communication. Several applications of edge computing are discussed. The second part of this book considers several security issues in fog/edge computing, including the secure storage and search services, collaborative intrusion detection method on IoT-fog computing, and the feasibility of deploying Byzantine agreement protocols in untrusted environments. The third part of

this book studies the privacy issues in fog/edge computing. It first investigates the unique privacy challenges in fog/edge computing, and then discusses a privacy-preserving framework for the edge-based video analysis, a popular machine learning application on fog/edge. This book also covers the security architectural design of fog/edge computing, including a comprehensive overview of vulnerabilities in fog/edge computing within multiple architectural levels, the security and intelligent management, the implementation of network-function-virtualization-enabled multicasting in part four. It explains how to use the blockchain to realize security services. The last part of this book surveys applications of fog/edge computing, including the fog/edge computing in Industrial IoT, edge-based augmented reality, data streaming in fog/edge computing, and the blockchain-based application for edge-IoT. This book is designed for academics, researchers and government officials, working in the field of fog/edge computing and cloud computing. Practitioners, and business organizations (e.g., executives, system designers, and marketing professionals), who conduct teaching, research, decision making, and designing fog/edge technology will also benefit from this book. The content of this book will be particularly useful for advanced-level students studying computer science, computer technology, and information systems, but also applies to students in business, education, and economics, who would benefit from the information, models, and case studies therein.

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