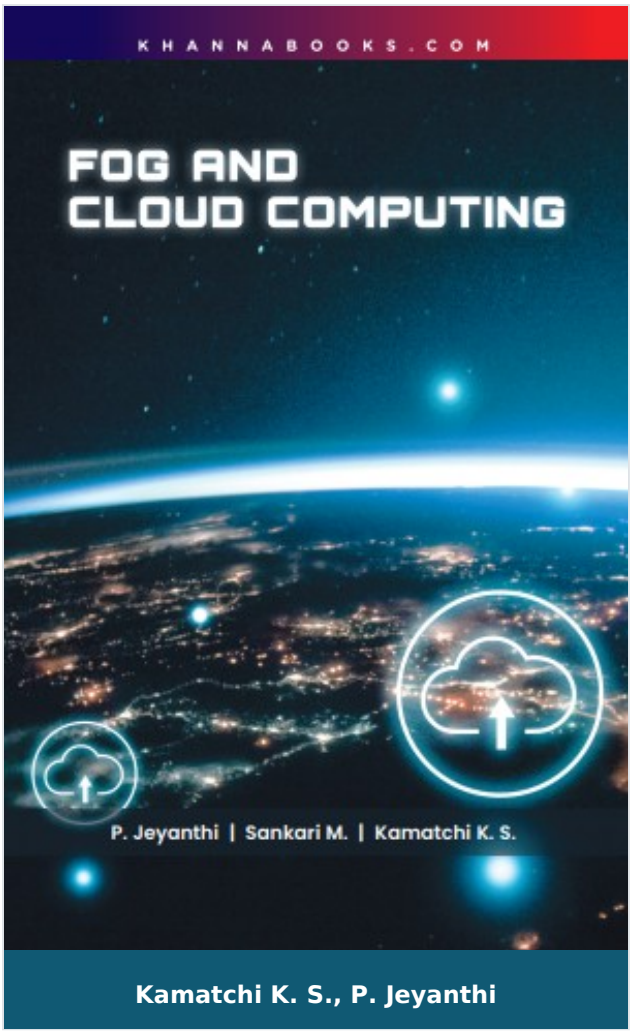

Kamatchi K. S., P. Jeyanthi

Fog and Cloud Computing

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Product Description

Fog and Cloud Computing

This book serves as a comprehensive and essential guide to mastering the modern landscape of cloud and fog computing, two fundamental technologies reshaping the digital era. The core purpose of this text is to provide a robust understanding of Cloud Computing, exploring its history, characteristics, architectural framework, and the key benefits of virtualization. It thoroughly details the major service models—Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS)—and analyzes the deployment models (Public, Private, and Hybrid Cloud) used by global players like Amazon, Microsoft, and IBM.

Crucially, the book extends this foundation into the emerging field of Fog Computing. Fog computing is presented as an indispensable, decentralized architectural layer that addresses the challenges of high latency and network congestion caused by the massive scale of Internet of Things (IoT) devices on traditional, centralized cloud systems. By covering cloud management, security strategies, and the transition to the edge network, this resource aims to bridge the gap between theoretical concepts and their practical, real-world applications. The target audience includes students, IT professionals, researchers, and technology enthusiasts seeking to leverage cloud infrastructure for innovation, digital transformation, and professional growth.

Salient Features:

- **Core Architectural Framework**: Provides a clear overview of cloud computing history, fundamental characteristics (e.g., scalability, multi-sharing), and the architectural components that enable robust cloud services.
- **Essential Service Models:** Dedicated coverage of the foundational service paradigms: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and

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Software as a Service (SaaS), explaining their structure and real-world utility.

- **In-Depth Virtualization**: Details the need for and types of virtualization (hardware, OS), including deep dives into essential hypervisors like Xen, KVM, and Hyper V, and open-source cloud platforms like Eucalyptus.
- **Cloud Security & Governance**: Addresses critical challenges of cloud data management, data center tiers, and essential security protocols like multi-factor authentication, data privacy, and strategies for avoiding vendor lock-in.
- **Industry Landscape Analysis**: Analyzes the competitive landscape by profiling major cloud players (e.g., AWS, Microsoft, IBM) and detailing the advantages and disadvantages of Public, Private, and Hybrid Cloud deployment models.
- **Fog & Edge Integration**: Introduces Fog Computing as an extension of the cloud, detailing its unique architecture, benefits (low latency), and comparing it structurally and functionally to the traditional cloud model.
- **Real-World Fog Applications**: Focuses on the practical utility of Fog Computing in critical modern fields like Smart Cities, Smart Grids, and enabling real-time analytics for high-volume data from Self-driven Cars.
- **Simulation & Testing Tools**: Features an introduction to the role and architecture of Cloud Simulator (CloudSim) for evaluating a nd testing cloud applications before real-world deployment.

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