DECENTRALIZED SYSTEMS AND NEXT-GENERATION INTERNET

DEVELOPMENT OF 6G NETWORKS AND TECHNOLOGY

Edited By
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Scrivener Publishing

WILEY

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Scrivener Publishing
100 Cummings Center, Suite 541J
Beverly, MA 01915-6106

Decentralized Systems and Next-Generation Internet

Series Editor: Mufti Mahmud and Suman Lata Tripathi

Scope: Next Generation Internet (NGI) is the focus of countries like the US and UK towards the improvement and revolution in the present and future internet with its backend networks and infrastructure to develop faster, reliable, secure internet platforms. The objective of NGI is to develop an advanced version of the internet. The target deliverables of NGI include building network communication architecture with enhanced levels of data access, human communication and productivity and achieving substantially and faster internet bandwidth and speed. An evolution of the internet from a low-level focus to higher level focus on interconnectivity, increased user interactions, video chat, and financial and social interactions in the virtual world are the major objectives towards development of NGI. A virtual world which is not owned or controlled by a single entity or metaverse in that a computer-generated virtual environment is created for reliable user interactions. Web 3.0 is an advancement that will control tomorrow's internet and metaverse centers for better user experiences. In the metaverse, users interacting using software from different vendors will experience monetization by each vendor with seamless interactions in spite of different technologies.

This series covers the information from the ground level of requirements for internet-based user interactions, platforms and applications leading to the development of next-generation internet. Future requirements and dependencies on more online activities will need to work more on developing decentralized systems to improve user experience with speedy, reliable and secured interactions in a virtual environment. This series will provide the opportunity to the academician and industry professionals to share their knowledge and experiences with learners and practitioners relevant to diverse areas of improvements for the development of next-generation internet and decentralized systems or metaverse.

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This edition first published 2025 by John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030, USA and Scrivener Publishing LLC, 100 Cummings Center, Suite 541J, Beverly, MA 01915, USA

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Wiley Global Headquarters
111 River Street, Hoboken, NJ 07030, USA

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Library of Congress Cataloging-in-Publication Data

ISBN 978-1-394-23065-5

Front cover images supplied by Adobe Firefly
Cover design by Russell Richardson

Set in size of 11pt and Minion Pro by Manila Typesetting Company, Makati, Philippines

Printed in the USA

10 9 8 7 6 5 4 3 2 1

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Preface

Exploring the benefits of 5G and beyond 5G along with the challenges associated with 5G play a key role in the development of next-generation internet. 6G is targeted to improve download speeds, eliminate latency, reduce congestion on mobile networks, and support advancements in technology. 6G has the potential to transform how the human, physical, and digital worlds interact with each other. 6G has the capability to support advancements in technology, such as virtual reality (VR), augmented reality (AR), metaverse, and artificial intelligence (AI). Machine learning and deep learning modules are also now an integral part of almost automated systems where signal processing is performed at different levels. Signal processing in the form of text, image, or video needs large data computational operations at the desired data rate and accuracy. Large data require more use of IC area with embedded bulk memories that further lead to power consumption. Trade-offs between power consumption, delay, and IC area are always a concern of designers and researchers. Energy-efficient high-speed data processing is required in major areas like biomedicine or healthcare, agriculture, transport, climate change and national security, and defense applications. This book will provide a foundation and initial inputs to researchers, scholars, and students working in the area of wireless network and high-speed data processing systems. Moreover, it will provide techniques, tools, and methodology to develop next-generation internet and 6G.

Acknowledgements

The editors would like to thank the Department of VLSI Design, Lovely Professional University, Phagwara, India; the Department of Computer Science, Nottingham Trent University, UK; the School of Electrical Engineering, Vellore Institute of Technology, Vellore; and the Department of Electronics and Communication Engineering, Periyar Maniammai Institute of Science and Technology and University, India for providing the necessary facilities required for completing this book. The editors would also like to thank researchers from different organizations like IIT, NIT, India and international universities who contributed the chapters in this book.