

SDN and NFV

A New Dimension to Virtualization

By **Brij B Gupta**

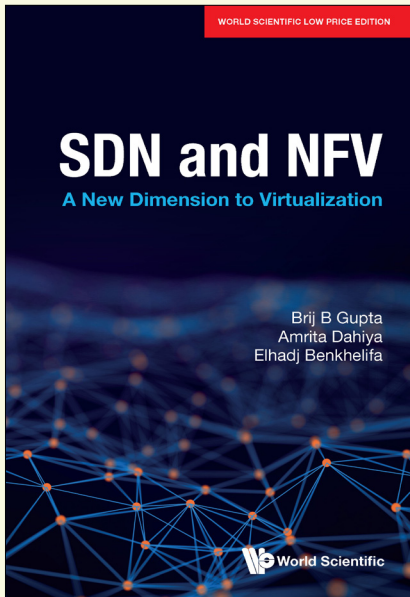
(Asia University, ROC)

Amrita Dahiya

(Thapar Institute of Engineering and Technology, India)

Elhadj Benkhelifa

(Staffordshire University, UK)



ISBN 9798886131604

Extent 292pp

Binding Paperback

Year 2026

Price Rs. 1450

ABOUT THE BOOK

Software-defined network (SDN) and network function virtualization (NFV) are two technology trends that have revolutionized network management, particularly in highly distributed networks that are used in public, private, or hybrid cloud services. SDN and NFV technologies, when combined, simplify the deployment of network resources, lower capital and operating expenses, and offer greater network flexibility. The increasing usage of NFV is one of the primary factors that make SDN adoption attractive. The integration of these two technologies; SDN and NFV, offer a complementary service, with NFV delivering many of the real services controlled in an SDN. While SDN is focused on the control plane, NFV optimizes the actual network services that manage the data flows. Devices such as routers, firewalls, and VPN terminators are replaced with virtual devices that run on commodity hardware in NFV physical networking. This resembles the 'as-a-service' typical model of cloud services in many aspects. These virtual devices can be accessed on-demand by communication, network, or data center providers.

This book illustrates the fundamentals and evolution of SDN and NFV and highlights how these two technologies can be integrated to solve traditional networking problems. In addition, it will focus on the utilization of SDN and NFV to enhance network security, which will open ways to integrate them with current technologies such as IoT, edge computing and blockchain, SDN-based network programmability, and current network orchestration technologies. The basics of SDN and NFV and associated issues, challenges, technological advancements along with advantages and risks of shifting networking paradigm towards SDN are also discussed. Detailed exercises within the book and corresponding solutions are available online as accompanying supplementary material.

READERSHIP

Graduate- and postgraduate-level students in Robotics and Automated Systems, Networking, Software Engineering and Digital Security, Innovation, Technology, Knowledge and Information Management.

For orders and enquiries, please contact us:

Feel Books Pvt. Ltd.

4381/4 Ansari Road Daryaganj, New Delhi 110002, Tel: +91 11 47472600, Email: marketing@feelbooks.in

www.feelbooks.in

CONTENTS

- Elements of Modern Networking
- Introduction to Networking Concepts
- SDN and NFV: Introduction, History, and Evolution
- SDN Basic Architecture
- SDN Controllers
- The OpenFlow Switch
- SDN Application Plane
- Network Function Virtualisation
- SDN Security and Challenges
- SDN and NFV with Other Technologies

ABOUT THE AUTHOR

Brij B Gupta is Director of the International Center for AI and Cyber Security Research and Innovations, and Distinguished Professor with the Department of Computer Science and Information Engineering (CSIE), Asia University, Taiwan. In more than 17 years of his professional experience, he published over 500 papers in journals/conferences, including 35 books and 12 Patents with over 25,000 citations. He has received numerous national and international awards, including the Canadian Commonwealth Scholarship (2009), Faculty Research Fellowship Award (2017), the Visvesvaraya Young Faculty Research Fellowship Award from the Indian Ministry of Electronics and Information Technology, Government of India, the IEEE GCCE outstanding and Women in Engineering (WIE) paper awards, and National Institute of Technology Kurukshetra, India's Best Faculty Award (2018 and 2019), respectively. Prof. Gupta was selected for Clarivate's Web of Science Highly Cited Researchers in Computer Science (top 0.1% researchers in the world) consecutively in 2022 and 2023. He was also listed in Stanford University's ranking of the world's top 2% of scientists in 2020, 2021, 2022 and 2023.

Amrita Dahiya received her PhD from NIT Kurukshetra, India. She completed her MTech from Banasthali University, Rajasthan, and her thesis from Jawaharlal Nehru University, From 2016–2019, she worked as a Junior Research Fellow in a Department of Science & Technology Science and Engineering Research Board (DST SERB) funded project. Currently, she is working as an Assistant Professor in Punjab Engineering College (PEC), Chandigarh. She has published several papers in reputed journals and conferences. Her research interests include information and cyber security, web security, denial of service attacks, online social network and machine learning.

Elhadj Benkhelifa is currently working as a Full Professor at the School of Computing and Digital Technologies, Staffordshire University, UK. He has extensive experience in working with industry on real-world business problems. Elhadj (2014–2016) was also the Faculty Director of the Mobile Fusion Applied Research Centre (45 PhD students and 15+ Staff). Over the past years, Elhadj has built a rich portfolio of successful collaborative cutting edge research projects. Elhadj is the Founding Head of the Cloud Computing and Applications Research Lab, leading a team of 8 PhD students and research staff. Elhadj has a strong research publication (130+) and dissemination track record and is the co-founding chair of several pioneering conferences and workshops, including the IEEE Annual Series of International conference on Fog and Mobile Edge Computing and International Conference on Software Defined Systems and International conference on IoT systems Management and Security. Elhadj's research covers many aspects of cloud computing, including security, mobile cloud, software-defined systems, cloud forensics, IoT and cloud, fog and mobile edge computing, cloud computing resilience, social network analysis, to mention a few from the most recent works. He has also served as a Guest Editor of many journal special issues, such as the recent special issues of the IEEE Transactions on Cloud Computing on the topic of mobile cloud and IEEE Transactions on Industrial Informatics. Elhadj is Director at Yotta Laboratories Ltd., Senior R&D Advisor to a number of companies in the UK and member of several panels and committees within the UK and internationally.

For orders and enquiries, please contact us:

FEEL
Books

Feel Books Pvt. Ltd.

4381/4 Ansari Road, Daryaganj, New Delhi 110002
Tel: +91 11 47472600, Email: marketing@feelbooks.in

Delhi • Mumbai • Bengaluru • Kolkata • Chennai • Hyderabad



www.feelbooks.in