

Preface

Over the past few decades, the Internet, as a huge success, has permeated almost every aspect of our daily life. However, with its fast growth and development, the current settings of the Internet exhibit various shortcomings, for instance, the security problems, the lack of support of flexible services, the inability to provide mobility and the insufficient support of manageability. These shortcomings are serious obstacles to the further development of the Internet. Therefore, the networking research community has engaged in an ongoing conversation about how to move the Internet forward.

Arguments about whether researchers should focus on improving today's Internet architecture or on designing new network architectures, which are unconstrained by the current system, always exist. Jennifer Rexford from Princeton University first gave his viewpoint that a "clean-slate design is important for enabling the networking field to mature into a true discipline, and to have a future Internet that is worthy of society's trust." We believe this could be proven eventually. Furthermore, although there have been many improvements on top of the current Internet architecture, few, if any, can comprehensively, effectively and sustainably solve the aforementioned problems.

More and more researchers have recently reported that problems about the Internet originate mostly from the limitations of its primary design. Many efforts have been made worldwide to investigate and develop the future Internet technologies and systems. Furthermore, the research community and the telecom industry have started to explore the new approaches to build the future Internet, such as Future Internet Network Design (FIND), Future Internet Architecture (FIA) in the USA; Future Internet Research and Experimentation (FIRE) and FIRE + in the European Union. Now, designing and building up the future Internet frame has become one of the most important and urgent topics in the research field of information networks. Thanks to these efforts, remarkable progress has been made for the future Internet. However, a general and ultimate solution for the future Internet has yet to be introduced.

This book examines the recent research on the future Internet all over the world and introduces a promising design for the future Internet named by *Smart*

Collaborative Identifier Network (SINET). SINET is intended to address the main issues and defects existing in the current Internet architecture. In this book, we present SINET's basic theories and principles, a broad range of architectures, protocols, standards and future research directions. Over the last decade, a variety of theoretical models and industrial applications have demonstrated that SINET is able to manage most of the problems of today's Internet. Through the comprehensive experiments and practical verification, SINET offers impressive flexibility, security, mobility, manageability and efficient resource utilization.

The book consists of 13 chapters in total. To give a clear and all-round introduction to the SINET, the chapters are further categorized into three parts. First, we introduce the Theory and Principle of SINET in Part I, which includes Chaps. 1–6. With knowledge of the basic principle, we detail many key technologies of SINET in Part II, which consists of Chaps. 7–10. Finally, some applications and developments are discussed and analyzed in Part III, comprising Chaps. 11–13.

To profit the audience the most, we expect the readers to have basic knowledge of the current Internet architecture and a brief understanding of how the current Internet works. This book can be used as a reference for researchers and practitioners interested in or working in the field of Internet design and the future Internet architecture. The contents are also suitable for both graduate students and senior undergraduate students in the fields of computer science, information science, computer networks and communication engineering. We hope that this book will serve as a valuable blueprint and contribute to the future Internet. We also hope to attract more researchers worldwide in this community to exchange ideas and to build a more effective and powerful Internet collaboratively.

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<http://www.springer.com/978-3-662-49141-6>

Smart Collaborative Identifier Network

A Promising Design for Future Internet

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2016, XXXI, 318 p. 187 illus., 21 illus. in color.,

Hardcover

ISBN: 978-3-662-49141-6