CALL FOR CHAPTER PROPOSALS

Future Internet Designs

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Introduction

Various proposals have been made over the years to maintain the original design principles of the Internet model (including simplicity, flexibility and extensibility principles) while allowing for more dynamicity in the way networks are designed and operated. Such dynamics are manifold: introducing some intelligence in the networks facilitates the progressive automation of device configuration tasks and overall service delivery procedures, whereas device autonomy improves decision-making processes and self-repair capabilities, thereby removing the constraints imposed by physical topologies.

Advanced context-based routing and forwarding schemes are also nurturing, thus paving the way to implementations that can overcome complications related to multi-vendor networking environments. Some of these proposals are evolutionary, others are rather revolutionary.

For the past couple of years or so, network automation techniques that include Software-Defined Networking (SDN) and dynamic resource allocation schemes have been the subject of a significant research and development effort. Likewise, Network Functions Virtualization (NFV) and the foreseeable usage of a set of Artificial Intelligence techniques to facilitate the processing of customers' requirements and the subsequent design, delivery and operation of the corresponding services are very likely to dramatically distort the conception and the management of networking infrastructures.

Some of these techniques are being specified within SDOs (Standards Developing Organization) while others remain perceived as a "buzz" without any concrete deployment plans disclosed by Service Providers. An in-depth understanding and analysis of these approaches should be conducted so as to help Internet players in making appropriate design choices that would meet their requirements as well as their customers'.

The first edition of this book aimed at providing insight on some of these approaches that will inevitably reshape the Internet. This new edition not only revisits some of the chapters

that were dedicated to these techniques in light of their recent evolution. It is also augmented with chapters that further elaborate on the most recent developments of networking technologies. This book thus provides a rigorous in-depth analysis of the promises, pitfalls and other challenges raised by these initiatives, while avoiding any speculation on their expected outcomes and technical benefits.

Objective of the Book

This book aims to shed some light on the foreseeable yet dramatic evolution of Internet design principles and also echoes the deployment of some of the architectural designs discussed in the "Handbook of Research on Redesigning the Future of Internet Architectures". Its major ambition remains to offer a comprehensive overview on the recent advances in networking techniques that are likely to shape the future Internet and which also mitigate currently known issues. Towards this end, we solicit contributions about the relevant techniques that fall into the scope of the topics listed below.

Recommended topics include, but are not limited to, the following:

- Issues with current Internet architectures
- Forwarding and routing schemes with a focus on novel routing architectures (e.g., Babel, RIFT, BGP Auto-discovery)
- Protective and collaborative networking approaches
- Advanced network service production schemes by means of automated tasks and procedures
- Interconnect design schemes
- Security trends for a new Internet era
- Massively-deployed Internet of Things (IoT) networks and services: issues, design and production practices, foreseeable impacts (e.g., performance, scalability)
- Users' privacy preservation and networking techniques
- Internet measurement, modeling, and visualization at large
- Close collaboration between IP and transport layers (e.g., for fine-tuned, application-inferred, traffic engineering purposes)
- CPE (Customer Premises Equipment) serviceability and security
- Energy-aware networking
- Service Assurance and Fulfillment techniques

- CDN (including CDN Interconnection) service and network design redux (e.g., taking advantage of edge computing resources)
- Software-Defined Networking (SDN) with a focus on deployment considerations and experience sharing
- Network Virtualization and Abstraction
- Network Functions Virtualization (NFV) with a focus on deployment considerations and experience sharing
- Distributed services (including gaming and VoIP) and how their design affects Internet operation at large
- Novel Data Center architectures and their ability to take advantage of automation techniques
- Novel transport protocols, challenges, and deployment experience
- Deployability assessment of Self-* (self-healing, self-organized, etc.) architectures
- Internet Governance
- Studies on Internet fragmentation (geographic-based networks)
- Novel network management and operations approaches
- On the failure of traditional QoS models and their foreseeable evolution
- Network and service automation and the role of Artificial Intelligence applied to dynamic network resource provisioning
- Trends in transmission techniques (optics, satellite communications, quantum communications)

Submission Procedure

You are invited to submit to the editors a 2-page extended abstract of the chapter you propose. Full manuscripts will be invited upon the acceptance decision based on the initial proposals. A second round of review of the full manuscripts will be organized before their final versions are produced for publication.

The initial extended abstract must contain the following information:

- Title
- Full list of authors with affiliations and contact information
- A list of keywords
- 2-page description of the chapter contents: problem statement, technical options, evolution perspectives, etc., along with the foreseen chapter organization.

Important Dates

April 15, 2020: Submission of initial extended abstract
May 15, 2020: Notification of acceptance
October 30, 2020: Submission of full manuscript
December 7, 2020: Return of final review
December 21, 2020: Submission of final version with revisions
2021: Target date for publication