Introduction—Special Issue on New-Generation Network

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At the Network Research Headquarters of the National Institute of Information and Communications Technology (NICT), we have been conducting research and development of a New-Generation Network (hereinafter referred to as "New-Generation NW") based on a new non-traditional approach in order to establish social infrastructure of the future which will resolve various current network-related issues. We are taking this initiative based on the third medium and long term plan, which was implemented from fiscal 2011. Specifically, we have been carrying out the New-Generation NW R&D Project with the following goals, aiming to realize the New-Generation NW around 2020:

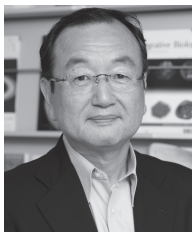
1) Establish a platform for the New-Generation NW basic structure including the application layer.
2) Establish a virtualized network platform.
3) Conduct verification tests assuming the implementation of network infrastructure that enables multiple heterogeneous services, and establish the network platform.

During this final fiscal year of the third medium and long term target period, we have achieved most of the goals mentioned above by developing prototypes, conducting verification tests and summarizing the accomplishments made thus far.

Software-defined networking (SDN) and network-function virtualization (NFV), whose practical application is progressing, are the embodiments of some of the above-mentioned goals. The current focal aspects of the SDN and NFV are network operation, management cost reduction and the provision of speedy network services to users. We set up the goals of the New-Generation NW R&D Project based on the innovative and creative vision that we should create a system in which a part of application functions can be processed in the network, rather than merely resolving network issues. In this regard, practical application of such a system is moving forward as indicated by the terms "edge computing" and "fog computing." I am confident that the concept of the New-Generation NW—fusion of network functions and computing functions like cloud computing—will be embodied in the near future.

In this special issue, we will mainly report accomplishments made thus far in the New-Generation NW R&D Project. In Chapter **2**, Professor Masayuki MURATA of the Graduate School of Osaka University contributed a paper regarding the goal of New-Generation NW R&D. In Chapter **3**, an overview of the project is presented. In Chapter **4** and subsequent sections, we present research papers on four different technological aspects. In "**4** New-Generation Network Platform," we report the study on New-Generation NW architecture and the accomplishments made in creating element technology for the network. Studies in **4-2** through **4-4** on network virtualization and those on New-Generation NW Service Infrastructure in Chapter **5** were carried out as a part of commissioned R&D activities. Then, in Chapter **6**, we explain current NICT activities concerning an Information-Centric Network that facilitates the creation of a new paradigm. In Chapter **7**, we report on the Japan-wide Orchestrated Smart/Sensor Environment (JOSE) as a testbed of a very large-scale information sharing network and research results associated with IoT/M2M. In addition to these efforts, it is vital for us to coordinate with other countries and promote international standardization for further advancement of the abovementioned technological R&D activities. In Chapter **8**, the final section, we explain the outcome of these activities and the current status of industry-academia collaboration in Japan.

Lastly, I would like to say that these accomplishments in this project would not have been possible without the participation of many company and university researchers. While space is too limited here to list the names of all of the collaborators, we deeply thank them for their enthusiastic contributions.



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