

## Executive Summary

The 30-year-long Heisei era has come to a close, giving way to the Reiwa era this past May. Heisei began in 1989, well before the Internet went mainstream, with the first commercial Internet services being launched in 1993. Windows 95, which contributed greatly to the spread of the Internet, was released in 1995. Google was founded in 1998. NTT Docomo launched i-mode, an Internet connection service for mobile phones, in 1999. NTT East and NTT West launched the Bflet's FTTH service in the year 2000. It was in 2001 that NTT Docomo launched FOMA, the world's first 3G mobile phone service. Apple released the first iPhone in 2007. And in 2010, NTT Docomo launched its 4G mobile phone service, Xi. The Heisei era's 30 year run saw substantial advances in information communications not only in Japan but across the globe.

This is our first IIR issue of the Reiwa era. While 5G mobile services are set to roll out in some countries, the monopolization of information by large platform operators has become problematic. In Japan last year, the Ministry of Internal Affairs and Communications launched a comprehensive assessment of competition rules in the telecommunications business, with an expansive scope covering not only the network layer but the platform and device layers as well. Under discussion is a vision for the country's networks with a view to 2030. Information and communication technology will continue to make immense contributions to the advancement of society, and we at IIJ hope to play our part as well.

The IIR introduces the wide range of technology that IIJ researches and develops, comprising periodic observation reports that provide an outline of various data IIJ obtains through the daily operation of services, as well as focused research examining specific areas of technology.

Our periodic observation report for this issue, found in Chapter 1, looks at messaging technologies with a focus on email. We examine deployment rates for SPF, DKIM, and DMARC sender authentication based on communications received via IIJ's email servers. Although SPF is quite well known, awareness of DMARC is yet to move forward. In light of survey data indicating that 80% of federal government domains in the United States have DMARC records, we will need to do something to raise awareness of DMARC in Japan. The report looks at deployment rates for sender authentication, discusses the encryption of email delivery routes, and describes the activities of M<sup>3</sup>AAWG and JPAAWG, in which the author himself is involved.

Our first focused research report for this issue in Chapter 2 discusses identity management and distribution based on blockchain technology. The report looks at ERCs (Ethereum Requests for Comment) that use the Ethereum blockchain for credentials and touches on use cases in which credentials are used as public certifications. It also discusses the focus on blockchain-based credential management technologies, with several vendors having put forward concepts like DIDs (Decentralized Identifiers) and SSI (Self-Sovereign Identity) in the past few months.

Our second focused research report in Chapter 3 is about eSIMs. IIJ became a so-called full MVNO last year, with its own HLR/HSS systems. One feature that becoming a full MVNO enables IIJ to provide is eSIMs. The report explains why eSIMs are necessary and how they work, and then discusses IIJ's and other companies' initiatives in this area. The process of setting up communication services contracts is set for major changes in a world where physical SIM cards are not required and the profiles used to manage communications contracts are passed around as electronic data.

Through activities such as these, IIJ strives to improve and develop its services on a daily basis while maintaining the stability of the Internet. We will continue to provide a variety of services and solutions that our customers can take full advantage of as infrastructure for their corporate activities.



**Junichi Shimagami**

Mr. Shimagami is a Senior Executive Officer and the CTO of IIJ. His interest in the Internet led to him joining IIJ in September 1996. After engaging in the design and construction of the A-Bone Asia region network spearheaded by IIJ, as well as IIJ's backbone network, he was put in charge of IIJ network services. Since 2015, he has been responsible for network, cloud, and security technology across the board as CTO. In April 2017, he became chairman of the Telecom Services Association of Japan MVNO Council.