

## Executive Summary

While some countries have started vaccinating against COVID-19, variants of the virus are also now being detected, and some regions remain under heavy lockdown. The situation remains unpredictable in Japan too, with a sharp rise in case numbers seen toward the end of 2020 and a second state of emergency declared at the beginning of 2021.

While COVID-19 restricts people's activities worldwide, every day we are reminded of how information and communications technology (ICT), most prominently the Internet, supports our lives as members of society. People restricted from going out have turned to video content for entertainment, resulting in a substantial increase in Internet traffic, as previously discussed in the IIR. Companies have of course introduced remote work and people are increasingly working online. Many people have also probably noticed an increase in food delivery services—most of the orders are placed via the Internet, with payments also being made online. We also hear that online shopping transaction volumes are rising. Yet all of these services already existed, so it may also be worth asking whether they are providing any new sensations or experiences to users, or whether COVID-19 simply provided an impetus for society-wide uptake.

With vaccinations finally set to start in Japan too, we are now in a position to look toward the post-COVID world. The world faces a great many issues quite aside from COVID-19, and issues common to all have also been identified in the form of SDGs. As part of the information and communications industry, we will be looking at how these major issues for society might be solved and how ICT and the Internet can contribute in this regard.

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.

Chapter 1 presents our SOC Report, our periodic observation report for this edition. IIJ's SOC analyzes data obtained through the operation of IIJ's services, data that it collects independently, and data from external sources. Since 2017, we have published information on threats we have observed and a range of security topics through wizSafe Security Signal, and in this report we review trends in security incidents in 2020. The report looks at security incidents IIJ's SOC has been focusing on, including attacks targeting vulnerabilities in SSL-VPN products and attacks involving Emotet and IcedID.

The focused research report in Chapter 2 explains RPKI (Resource Public-Key Infrastructure). Even today, with the Internet now serving as part of our global social infrastructure, the Internet's routing system is not impervious to route hijacking and operator configuration errors. RPKI is a mechanism for bolstering this system by using digital certificates to validate routing and other information exchanged on the Internet. The report gives an overview of RPKI, discusses developments in this area, and describes IIJ's own efforts.

The focused research report in Chapter 3 discusses the use of networks in broadcast production. The year 2020 initially brought with it expectations of a huge event in the form of the Olympics, and it was also a year of advances in remote work at many places of employment. The report looks at frameworks for remote production that use IP networks suitable for broadcasting events like the Olympics, and discusses validation tests of an Internet-based remote work setup in a broadcast production setting, with some words about future prospects.

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.