Executive Summary

In the previous edition, I touched on OpenAI's ChatGPT. Since then, information about generative AI and large language models has dominated the public consciousness, not only in the IT industry but across society as a whole. One gets the sense that these technologies are taking the world by storm, with more and more companies using them.

It does also seem, however, that people are increasingly also talking about the negative aspects of generative AI. At the G7 Digital and Tech Ministers' Meeting in Takasaki, Gunma, for instance, participants endorsed the G7 Action Plan for Enhancing Global Interoperability of AI Governance, and the G7 Hiroshima Leaders' Communiqué addressed "governance, safeguard of intellectual property rights including copyrights, promotion of transparency, response to foreign information manipulation, including disinformation, and responsible utilization of these technologies."

AI is a technology, and it goes without saying that those who develop and use such cutting-edge technologies must hold themselves to high ethical standards. As a technology engineer myself, I can say that these recent events have given me a renewed awareness of this.

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 in Chapter 1 discusses messaging with a focus on email. All sorts of services have been developed on the Internet, but email remains one of the essentials, and IIJ has been providing email services since its founding. While this important service has a long and storied history, improvements are still being made today. Against that backdrop, the report discusses the discontinuation of one of IIJ's email services, DMARC 2.0 as a key M^{3}AAWG topic, and the uptake of sender authentication and STARTTLS.

The focused research report in Chapter 2 introduces malware analysis tools developed by an IIJ employee. Malware is a major threat on the Internet and has caused all sorts of damage. As a malware and forensics analyst at IIJ, the author is engaged in customer incident response and also draws on his experience to develop malware analysis tools. The author implements features into these tools that he deems necessary from the perspective of someone who actually performs the analyses, and the report thus provides a compelling glimpse into real-world malware analysis.

Chapter 3 presents a focused research report on authentication and authorization using cross-device flows. With Internet-based services being part of our social infrastructure, the importance of authentication and authorization when using these services is ever increasing. Cross-device flows facilitate safer, easier-to-use authentication and authorization flows via the smartphones that most people keep on their person. The report discusses a number of device flow specifications, both those that have been standardized and some that are still being drafted, and goes over the differences between them.

And following on from our piece on the IIJ backbone network in the previous edition, the focused research report in Chapter 4 looks at IIJ's efforts with DNS. It goes without saying that DNS is a cornerstone of the Internet's foundations, and IIJ has been engaged with DNS in all sorts of ways since its founding. The report looks back on 30 years of IIJ and DNS from the perspective of services and technology, and also discusses the relationship between DNS and society at large. It also provides a picture of DNS back at the dawn of the commercial Internet era, and I think you will find it an intriguing read.

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's MVNO Council, stepping down from that post in May 2023. In June 2021, he also became a vice-chairman of the association.