

## Executive Summary

As announced in the previous volume, we have revised the content of our IIR, and Vol.37 is the second report since this revision. The summary of Internet security, which we published periodically until Vol.35, IIJ's SOC team will now be issuing a monthly observation report from a website called, wizSafe Security Signal. Data from September has been published, and we will endeavor to provide information there in a timely manner, so we encourage you to take a look.

IIJ aims to introduce the wide range of technology that we research and develop in this IIR, which is comprised of periodic observation reports that provide an outline of various data we obtain through the daily operation of services, as well as focused research where we examine specific areas of technology.

Chapter 1 is the periodic observation report for this volume. Here, we examine the state of the Internet, including BGP routes, DNS queries, IPv6 traffic, and mobile traffic, based on information obtained through the operation of IIJ's network and server infrastructure. It is the first time we have presented this information in an IIR, and in some areas, we have only been able to provide interim results, but we intend to continue reporting on this topic regularly going forward.

Chapters 2 through 4 are our focused research. In Chapter 2, we covered VSS (Volume Shadow Copy Service), which is a Windows function related to backups. VSS makes it possible to create snapshots, which can be used to restore the attack tools used by attackers, in addition to temporary and altered files, so they are recognized by analysts as one of the most important pieces of data in digital forensics. However, while performing technical analysis of digital forensic data, we confirmed an issue where user data is not saved correctly to snapshots even when VSS is enabled. We investigated the cause of this issue and the scope of its impact, while also discussing methods for handling it.

Chapter 3 is about video over IP technology, which is quickly garnering interest at broadcasters. Together with the proliferation of the Internet, a variety of media has come to use IP (Internet Protocol) as infrastructure. Magazines and newspapers, as well as music and video content that were once distributed on CDs and DVDs, are now delivered over IP. Currently, one hot topic is the delivery of uncompressed audio and video signals such as those utilized by broadcasters over IP networks. In this chapter, we discuss the reasons why video over IP is necessary, in addition to the status of standardization. We also report on the PoC (Proof of Concept) activities carried out by IIJ.

In Chapter 4, we examine intent-based networking (IBN), which is said to be the next big thing after SDN and SD-WAN. Using IBN, users set the policies they want to implement for their work, and the network verifies the feasibility of these before implementing them automatically. The network also constantly monitors itself and optimizes operation. With IBN, IIJ aims to realize a new system for security that assumes a zero trust environment. In this chapter, we provide concrete details about this initiative, and discuss its future prospects.

IIJ continues to strive towards improving and developing our services daily, while maintaining the stability of the ICT environment. We will keep providing 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.