Executive Summary

Recently there have been a lot of articles regarding the blockchains used as a core technology in virtual currencies. Although along with cryptographic technology these are expected to expand the potential for new business and technologies, we sense a certain amount of trepidation toward the use of increasingly complex and advanced technology, with Bitcoin among the methods used for the payment of ransom money resulting from ransomware. We have repeatedly covered technological trends for the safe and secure use of the Internet, and we believe it is our mission to dispel these fears by providing technological information that cultivates a better understanding of not just Internet infrastructure, but also security as it applies to the use of the Internet as social infrastructure.

This report discusses the results of the various ongoing surveys and analysis activities that IIJ, as a service provider, carries out to support the Internet and cloud infrastructure, and enable our customers to continue to use them safely and securely. We also regularly present summaries of technological development as well as important technical information.

In Chapter 1, we trace and analyze attacks and occurrences we have covered in the past, with a focus on incidents and events that took place day-to-day during the current survey period. As before, DDoS attacks by groups such as Anonymous continue to occur, and stemming from sites associated with the whaling controversy, attacks targeting public agencies and personal websites that do not seem directly related have also been observed. By discussing the current state of the growing damage caused by ransomware infections that employ increasingly sophisticated techniques to demand ransom money, and detailing countermeasures, we hope to provide some assistance for dealing with the situation. We also take a look at trends in international standardization regarding cryptography.

In Chapter 2, we examine messaging technology for the first time in about a year. Although there are temporary increases in the volume of spam, over the past few years there has been a general downward trend. Regarding technological trends, we discuss the features of DMARC in detail, while also giving a supplementary explanation based on information obtained from IIJ services.

In Chapter 3, we cover technological trends by going over the discussion of TLS at the IETF. The similar SSL technology was used for a long time, but from 2011 it was recommended that its use be prohibited, and that systems transition to TLS. However, it has been around 17 years since TLS was established, and eight years have already passed since the currently mainstream TLS 1.2 was drawn up, so work on developing TLS 1.3 is proceeding at a rapid pace. In this chapter, we hope to provide more insight by giving an explanation of operation using TLS 1.2, while also discussing the new technology to be incorporated in TLS 1.3, although it may ultimately change.

Around the time that this volume is published, the G7 Ise-Shima Summit will have finished, and the entire world will be waiting in anticipation for the Rio de Janeiro Olympic and Paralympic Games. I am sure that work toward bolstering social infrastructure and security measures will be happening at a breakneck pace behind the scenes. These days we have a stronger sense of the need to implement a range of security measures, and I hope that the articles in this report proved useful not only on the infrastructure side, but also for collaborating with users to consider efforts to protect the social infrastructure that the Internet has become.

Through activities such as these, IIJ continues to strive towards improving and developing our services on a daily basis, while maintaining the stability of the Internet. We will keep providing a variety of services and solutions that our customers can take full advantage of as infrastructure for their corporate activities.

Yoshikazu Yamai

Mr. Yamai is an Executive Managing Officer of IIJ and Director of the Service Infrastructure Division.
Upon joining IIJ in June 1999, he was temporarily transferred to Crosswave Communications, Inc., where he was engaged in WDM and SONET network construction, wide-area LAN service planning, and data center construction, before returning to his post in June 2004. After his return he was in charge of IIJ's Service Operation Division. From April 2016 he joined the Infrastructure Operation Division, and now oversees the overall operation of corporate IT services at IIJ. He also heads IIJ's data center operations, and he played a key role in the establishment of the modular "Matsue Data Center Park," which was the first in Japan to use outside-air cooling.