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## Executive Summary

Russia's invasion of Ukraine began on February 24, 2022. Information on wars in the 21st century comes to us not only through traditional media such as TV but also directly through a range of sources via the Internet. To make proper sense out of the huge amount of information coming through, the receivers of that information need to educate themselves in advance and dispassionately scrutinize the information they receive. Yet it feels like the effort to do this is confounded by the sheer, overwhelming amount of information the Internet thrusts into the world.

Meanwhile, we are also seeing reports of attacks on Internet-based information systems, including DDoS attacks and system intrusions, as well as reports about the possibility of the Internet being divided up by a shutdown of DNS for ru domains or the severing of connections between networks. We are now bearing witness to the great impact of war on the Internet, which has become our global social infrastructure.

The news that SIM cards, in addition to food, water, and the like, were being distributed as part of the relief effort to Ukrainian refugees was also a reminder of how important the Internet is. I can only pray that the Internet will not be disrupted by the war and instead prove useful in bringing an end to this situation as soon as possible.

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. The report here looks at security developments IIJ's SOC has been focusing on, including an analysis of suspicious email subject lines related to COVID-19, vulnerabilities in Apache HTTP Server and Apache Log4j, cryptocurrency-related port scanning activity, and phishing sites.

The focused research report in Chapter 2 looks at mac\_apt, a forensic analysis framework being developed for macOS. mac\_apt implements enough features to make it a useful tool for macOS forensic analysis (rare in comparison with what's available for Windows). mac\_apt uses plugins to analyze a range of artifacts. This report is the first of a two-part series on the basics of creating a mac\_apt plugin. It goes over the code used in plugins already implemented and what the author has learned from actually creating plugins.

In our second focused research report, in Chapter 3, the author presents his findings on how Internet connectivity in Crimea has changed since Russia annexed the peninsula in 2014. As its name suggests, the Internet is a network of interconnected networks, and an analysis of Internet routing data can reveal the state of the interconnections. The report paints a detailed picture of how Crimea's Internet connectivity is being incorporated into Russia.

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.