

Executive Summary

Here is the final IIR for 2019. Japan suffered many natural disasters in 2019, not least those associated with heavy rainfall events. The heavy downpours in northern Kyushu in August, Typhoon Faxai, which caused widespread damage centering on Kanto in September, and Typhoon Hagibis remain fresh in memory. The term global warming tends to bring to mind rising atmospheric temperatures, but experts tell us that rising levels of greenhouse gases in the atmosphere will alter the overall state of the atmosphere, causing rainfall patterns to gradually change.

Companies in the information and communications industry are also taking action by switching to energy-saving equipment and pursuing energy efficiency in the datacenter, for instance. Against this backdrop, it was announced that the prototype of RIKEN's Fugaku supercomputer had taken the top global spot in the Green 500 ranking of the world's most energy-efficient computers.

Information and communications plays a diverse role in building a sustainable world, including through the use of energy-saving equipment and the use of information and communications technology to reduce energy consumption. IJ will also continue to develop technology with that in mind.

The IIR introduces the wide range of technology that IJ researches and develops, comprising periodic observation reports that provide an outline of various data IJ obtains through the daily operation of services, as well as focused research examining specific areas of technology.

The periodic observation report in Chapter 1 presents the 2019 edition of our rundown of Internet trends as viewed from IJ infrastructure. The report covers data on the number of IPv4 routes on the Internet, an analysis of DNS queries from the full resolver IJ provides to users, IPv6 usage on the IJ backbone, traffic on mobile networks and the FLET'S network around the time of natural disasters, and the history of the IJ backbone.

For the first time, we observed a decline in the number of unique IPv4 addresses in advertised routes, and this will bear watching ahead. Our observations also confirm that the use of IPv6 continues to rise steadily, as evidenced by increasing traffic volumes and increasing use among many service operators. And our analysis of traffic around October 12, when Typhoon Hagibis passed through Japan, showed a clear difference from the usual usage patterns.

The focused research report in Chapter 2 explains Linux memory imaging tools that can be used with the Volatility framework, which we use to analyze memory images when performing incident response and forensics. The report looks at LiME and crash, two tools that can be used to acquire Linux memory images, and describes how to acquire memory images in a way that has minimal impact on disk forensics.

Through activities such as these, IJ 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 IJ. His interest in the Internet led to him joining IJ in September 1996. After engaging in the design and construction of the A-Bone Asia region network spearheaded by IJ, as well as IJ's backbone network, he was put in charge of IJ 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.