

## Executive Summary

Although the events took place in another country, the election of Donald Trump in the U.S. Presidential Election caused a commotion around the world, and it is difficult to judge whether recent tumult in finance, economics, and foreign policy can be attributed to this being a favorable or unfavorable result. With talks between Prime Minister Shinzo Abe and Russian President Vladimir Putin coming up after that, it became even harder to drag our attention away from international politics. Under these circumstances, Internet traffic is continuing to grow at a steady pace. Online broadcasts related to the U.S. Presidential Election were consumed on a global scale, and factors such as spikes in traffic in the middle of the night in Japan have once again given us a real sense that the Internet is important social infrastructure that supports activities worldwide.

This report discusses the results of the various ongoing surveys and analysis activities that IJ, 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 focus on discussing incidents that occurred between July 1 and September 30. Each year we are extra vigilant in August and September due to dates of particular historical significance falling on these months, but over the past few years they have passed without major incident. There were some attacks related to pseudo-religious activity, and we have reflected on this three month period while also paying attention to historical events and political and social situations. We also took a look at the Mirai botnet malware. So-called IoT devices lack significant processing power on their own, but they are prone to malware infections when their security is not properly managed, and large numbers of these devices can form massive networks that are used to launch attacks. We have covered this topic here in the belief that care must be taken with regard to Internet infrastructure going forward.

In Chapter 2, we examine efforts in the Internet content distribution industry to unify streaming formats, and discuss measures for resolving issues with the methods currently used. Live streaming results in a slight delay compared to real time. Many people in the industry seek to stream live events in a form as close to real time as possible, and we expect initiatives to bridge this gap will gather momentum. We also believe more work will be done on standardization, including technology that enables the offline viewing of videos by downloading them to a mobile device when it is connected to Wi-Fi, as the use of offline playback is not progressing due to issues associated with the data bandwidth restrictions on mobile plans. We have provided an in-depth look at the inner workings of the streaming business, which is expected to see further development in the future.

In Chapter 3, we performed a scientific study of Wikipedia. It may be a hard concept to grasp, but a researcher studying Wikipedia discusses how they have been tackling the computerization of historical fact drilldown on a daily basis. They detail the process by which they came to the conclusion that the basic technologies built for analyzing Wikipedia could be applied to this after looking into the field of natural language research. In a sense, from a perspective similar to the analysis of big data and deep learning, this may serve as a method for uncovering historical facts from within the information stored on Wikipedia.

Through activities such as these, IJ 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 IJ and Director of the Service Infrastructure Division. Upon joining IJ 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 IJ's Service Operation Division. From April 2016 he joined the Infrastructure Operation Division, and now oversees the overall operation of corporate IT services at IJ. He also heads IJ'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.