Executive Summary

The mission of Internet operation is to keep the Internet up and running all the time in order to secure the availability of smooth communications over this social infrastructure for anyone, anywhere and at any time. The Great East Japan Earthquake, however, caused extensive damage to various social infrastructures including the Internet in the East Japan region. We pray for the swift recovery of the devastated area, and we would like to pay sincere respects and express generous gratitude to the operators striving to restore the infrastructure necessary to achieve this.

Meanwhile, on April 15. 2011 the APNIC regional internet registry (IR) that Japan belongs to and the JPNIC IR in Japan ceased allocation of IPv4 addresses via their regular allocation policy and entered the final phase of allocation. This means that the free pool of IPv4 addresses at these registries is effectively exhausted.

The issue of IPv4 address exhaustion was first raised in 1992. Following this, design of new version of the Internet protocol to replace IPv4 began with the IETF playing a central role, and considerable research and preparation work has been carried out over the course of about 19 years. We are now finally approaching the stage where this research and preparation will be brought to fruition.

This report discusses the results of the various ongoing surveys and analysis activities that IIJ carries out to maintain and develop the Internet infrastructure and enable our customers to continue to use it safely and securely. We also regularly present summaries of technological development as well as important technical information.

In the "Infrastructure Security" section, we report on the results of our ongoing statistics gathering and analyses for security incidents observed during the three months from January 1 to March 31, 2011. We also present our focused research for this period, discussing IIJ's new malware observation environment, the anti-forensic techniques employed by malware, and the impact of the Great East Japan Earthquake on telecommunications services in Japan, as well as related attacks.

In the "Messaging Technology" section, we examine spam ratio trends and regional source distribution, as well as trends in the main regional sources of spam, for 13 weeks between January and early April, 2011. We also discuss the relationship between botnet activity and regional sources of spam, analyze the connection between SPF authentication results and spam, and comment on the impact of IPv4 address exhaustion on anti-spam measures.

In the "Cloud Computing Technology" section, we discuss the results of our research into improving the utilization of large-scale Web servers, including simulation of the effect on overall traffic when Web content where access is concentrated is consolidated, and analysis of the variation in access frequencies over time for content where access is concentrated.

In the "Internet Operation" section, we examine the situation following the exhaustion of IPv4 addresses on April 15, 2011 and look at efforts towards improving the utilization of IPv4 addresses and migrating to IPv6 that will be necessary from now on, as well as issues related to these initiatives.

Under "Internet Topics," we provide an overview of the "World IPv6 Day" IPv6 trial event that was held around the world on June 8, 2011 to confirm the status of preparations for the migration to IPv6 and uncover outstanding issues, and also discuss initiatives within Japan.

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 solutions that our customers can take full advantage of as infrastructure for their corporate activities.

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President and CEO, IIJ Innovation Institute Inc. Mr. Asaba joined IIJ in its inaugural year of 1992, becoming involved in backbone construction, route control, and interconnectivity with domestic and foreign ISPs. He was named IIJ director in 1999, and as executive vice president in charge of technical development in 2004. Mr. Asaba founded the IIJ Innovation Institute Inc. in June 2008, and became president and CEO of that organization.