

Executive Summary

More than 10 years have already passed since the Internet came to be considered social infrastructure. Infrastructure has connotations of a fixed, stable framework, but the Internet continues to grow to this day. For example, broadband traffic volumes increased by as much as 17% between 2012 and 2013, and the number of smartphone contracts are expected to rise from 48,780,000 in 2012 to 65,080,000 by the end of 2013. Given these circumstances, it can be said that Internet infrastructure pervades the lives of a wide range of people, and it will no doubt continue to expand every day as new ways of using it are devised, and new content is added.

Another significant characteristic of Internet infrastructure is that many parts of it are implemented and controlled using software, from the administration of its functions, to the services that operate over it. The operation of this software is also carried out in a very open manner, and while this gives the Internet a large degree of flexibility and expandability, it also brings with it the potential for vulnerabilities and malicious attacks, as shown by a number of examples in this report. In recent years the concept of SDN (Software Defined Networking) has been introduced, and there have been some endeavors towards further increasing the flexibility with which software control can be used to operate network infrastructure and implement services.

This report discusses the results of the various ongoing surveys and analysis activities that IIJ carries out to support 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 give a month-by-month chronological summary of major incidents observed during the three months from July 1 to September 30, 2013, and report on the results of our statistics gathering and analyses for the entire period. We also present our focused research for this period, in which we discuss the PlugX RAT used in targeted attacks, details of a series of targeted email attacks, and an explanation of the Bitcoin virtual currency.

The “Internet Operation” section was previously titled “Messaging Technology,” where we provide statistical data and technical information regarding spam. These spam reports will now be made on an annual basis. In place of them we have this newly-titled section, where we will report on a wide range of initiatives related to infrastructure and services. In this volume, we examine the DNS amplification attacks that have often been used recently to carry out large-scale DDoS attacks. We also take a look at the problems associated with open resolvers, which are used as stepping stones in these attacks.

In the “Cloud Computing” section, we discuss the latest trends in the SDN technology for building and operating virtual networks using software. We also provide an overview of the OmniSphere product currently under development by IIJ affiliate Stratosphere for applying SDN to office LAN environments, including a brief discussion of the inner workings of this software.

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. President and CEO, Stratosphere 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 executive vice president in charge of technical development in 2004. When the IIJ Innovation Institute Inc. was founded in June 2008, Mr. Asaba became its president and CEO. When Stratosphere Inc. was founded in April 2012, he also became president and CEO of that organization.