Executive Summary

The utilization of cloud services by corporate users is increasing year after year. According to the Ministry of Internal Affairs and Communications' FY 2014 Information and Communications White Paper, the ratio of companies using cloud services stood at 33.1% at the end of 2013, which is about a 5% increase over the 28.2% ratio at the end of 2012. This shows that cloud services are on the threshold of going mainstream, with approximately a third of all companies using them in some form or other.

Meanwhile, the white paper also states that 37.4% of companies opting not to use cloud services cite security concerns as their reason. In August, there was an incident in which the private photos of a large number of famous celebrities leaked. These leaks occurred when users' cloud accounts were logged into through account hackings after they had taken photos on a smartphone that were automatically saved to the cloud. Because this was due to accounts being hacked, and did not involve the exploitation of a vulnerability in the system, responsibility for the leaks lay with the victims themselves. According to the white paper, smartphone ownership in Japan has reached 53.5%, and it is conceivable that these will be used for work purposes in more and more cases. To prevent leaks of confidential information such as the example above, it will be increasingly important for each user to have the up-to-date knowledge required to ensure the security of the data they handle, and take appropriate measures to protect it themselves.

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, 2014, and report on the results of our statistics gathering and analyses for the entire period. We also present our focused research for this period, including discussion of the Bash vulnerability known as Shellshock that was disclosed in September, and a look at a new method for attacking SSLv3 called the POODLE attack that was announced in October. Additionally, we give an overview of the account hacking techniques known as list-based attacks, and examine countermeasures for them.

In the "Content Delivery" section, we explain the current state of video streaming, which has been growing more prevalent in recent years, and is expected to account for around 80% to 90% of consumer traffic worldwide by 2018. We place particular focus on the characteristics of the H.265 codec standard that enables video streaming in ultra-high resolutions such as 4K, as well as MPEG-DASH that makes stable and efficient delivery over the Internet possible. We also present a case study based on the live streaming of the high school baseball summer championship that IIJ carried out this year.

In the "Cloud Computing Technology" section, we cover the basics of how SDN and the OpenFlow protocol enable the virtualization and software-based control of networks. We also introduce the Lagopus OpenFlow-compatible software switch that was open sourced this year as part of the O3 strategic R&D project funded by the Ministry of Internal Affairs and Communications to promote SDN. In particular, we discuss the dramatic performance improvements it achieves over conventional software switches, and how it enables packet transfer at a wire-rate of 10GbE.

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.

Author:

Toshiya Asaba
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.