Executive Summary

With the shift toward cloud computing over the last few years, it seems as if the Internet has evolved beyond merely serving as an open and simple network system for telecommunications, and is now playing a deeper role in today's advanced information society in a variety of contexts, incorporating information systems that were once outside the network as well as the information services realized through them.

According to a report published by the Ministry of Internal Affairs and Communications' Smart Cloud Study Group in May of this year, while 56.2% of businesses in the United States use cloud computing, businesses in Japan are lagging behind with just 14.8% utilizing cloud technology. However, the same report estimates that the market for cloud computing in Japan will expand, growing by a factor of 3.2 compared to 2010 levels to approximately 2.4 trillion yen in 2015.

Against this background we are reaching the point where consideration must be given to future developments, with the Internet transforming from a simple network infrastructure into an infrastructure that encompasses all manner of information systems.

Since last year IIJ and a number of other providers have launched cloud services, with business on these platforms swinging into action, and the development and construction of the systems, equipment, and infrastructure necessary to provide them starting to move forward. At the same time, it is also becoming more and more crucial to secure the stability and reliability of the networks that serve as the infrastructure for cloud services.

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 July 1 to September 30, 2010. We also present our focused research for this period, examining the preparations to be made for DDoS attacks on small-scale systems and security for shared systems such as cloud computing, as well as giving an overview of digital forensics.

In the "Internet Operation" section, we comment on technology known as DNSSEC that enables verification of responses from DNS, a service essential to the use of the Internet, and also look at the steps necessary when introducing this technology.

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 the 13 weeks between the end of June and the end of September, 2010. Additionally, in "Trends in Email Technologies," we report on the implementation status of sender authentication technologies and the current state of botnet countermeasures.

In the "Modular Eco-Data Centers" section, we provide a detailed explanation of the test system configuration and results of the proof-of-concept tests carried out for the development of IIJ's next-generation modular eco-data center, which uses container units with an outside-air cooling system.

IIJ will continue to publish periodic reports covering information such as this, and provide customers with a variety of solutions for the stable, secure, and innovative use of the Internet as an infrastructure for supporting corporate activities.

Author:
Toshiya Asaba
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.