

# Sender Authentication Technology Reaches the Practical Application Stage with a Focus on SPF

In this report we will present an overview of spam trends for week 27 through week 39 of 2011.

As was the case in the previous study, China was the top source of spam.

The volume of spam that had been in decline since the latter half of last year also seemed close to hitting bottom during this period.

## 2.1 Introduction

In this report we discuss the latest trends in spam and email-related technologies, and summarize various activities in which IJ is engaged. In this volume we focus on data for the period of 13 weeks from week 27 of 2011 (July 4 to July 10, 2011) to week 39 (September 26 to October 2, 2011), which corresponds to the 2nd quarter for many Japanese companies.

Additionally, in "Trends in Email Technologies," we report on the penetration rate of sender authentication technologies. In this report we also present survey results for services other than IJ's email services, and compare and comment on the penetration rate in Japan and other regions. We now believe that the penetration rate of sender authentication technology, in particular SPF (Sender Policy Framework), has risen significantly in Japan through the activities of organizations such as JEAG\*1 and the Anti-Spam mail Promotion Council\*2 in which the authors participate. We refer to external data to get to the truth of this matter.

## 2.2 Spam Trends

In this section, we will report on historical ratios of spam and the results of our analysis concerning spam sources based on trends detected by the Spam Filter feature provided through IJ's email services.

### 2.2.1 Spam Volume Decline Stops

Figure 1 shows spam ratio trends over the period of one year and three months (65 weeks), including the current survey period and the same period for the previous year. The average spam ratio for the current survey period was 48.2%. This is a significant drop of 30.8% compared to the same period for the previous year, but a drop of merely 2% compared to the last survey period. This indicates that the volume of spam that had been in decline since the latter half of last year may have hit bottom during this period. Additionally, although the suspension of large-scale botnet activity caused a drop in spam volume worldwide, it is possible that mail-based targeted attacks on specific companies are taking place, so the security threat may now actually be higher.

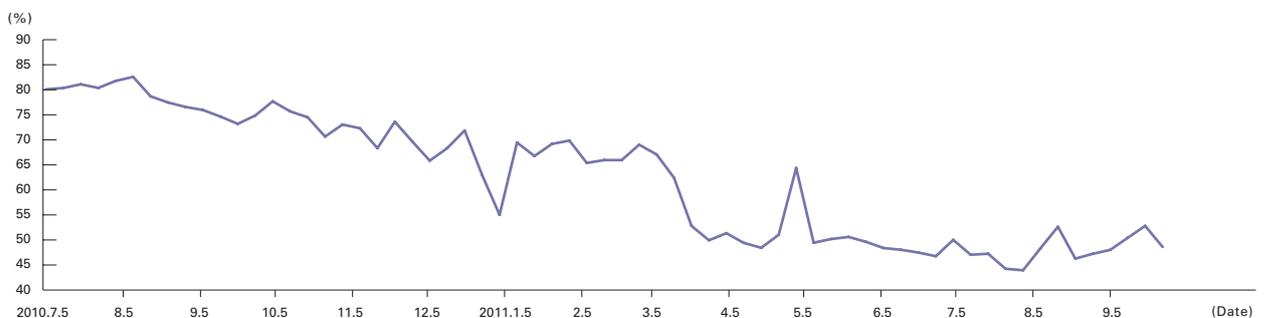


Figure 1: Spam Ratio Trends

\*1 Japan Email Anti-Abuse Group, <http://jeag.jp/> (in Japanese)

\*2 [http://www.dekyo.or.jp/soudan/anti\\_spam/](http://www.dekyo.or.jp/soudan/anti_spam/) (in Japanese)

## 2.2.2 China Remains in Top Spot

Figure 2 shows our analysis of regional sources of spam over the period studied. In this survey China (CN) remained the top regional source of spam, accounting for 32.2% of spam, or almost a third of the total. As in the previous report, Japan (JP) was in 2nd at 13.8%, with actual numbers also rising. The Philippines (PH, 5.6%) was 3rd, the United States (US, 5.6%) was 4th<sup>\*3</sup>, India (IN, 4.8%) was 5th, and South Korea (KR, 4.5%) was 6th.

### ■ Trends in the Main Regional Sources of Spam and Anti-Spam Activities

Figure 3 shows trends in ratios for the top six regional sources of spam from the beginning of 2011 to the current survey period. As demonstrated by these trends, China (CN) has held top place since the end of January 2011. Because China has been the source of more than double the spam volume of second place holder Japan (JP) during the current survey period, reducing spam from China would be an effective way of reducing spam received in Japan. Together with the Japanese government, we have held talks with China about the spam issue via the ISC<sup>\*4</sup>. During these talks we strongly encouraged the implementation of OP25B<sup>\*5</sup> that has been successful in Japan. However, unlike Japan, in China telecommunications carriers are separate from the companies that provide application services such as email, so it seems the telecommunications carriers that would have to implement OP25B have little awareness of the issue of spam and related complaints. This also appears to be the reason that the implementation of OP25B in South Korean is not gaining much ground. We will continue to present data from Japan and encourage the bolstering of countermeasures.

## 2.3 Trends in Email Technologies

Here we will examine a variety of technological trends relating to email. In this report we present a number of survey results regarding the adoption of sender authentication technology.

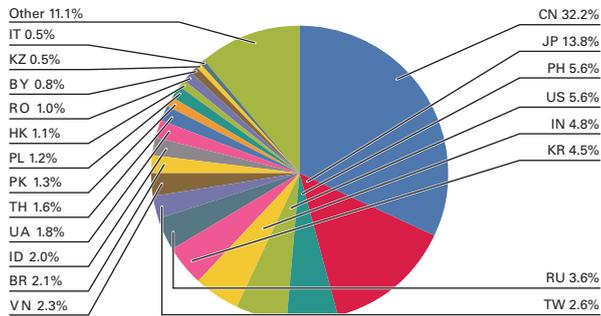


Figure 2: Regional Sources of Spam

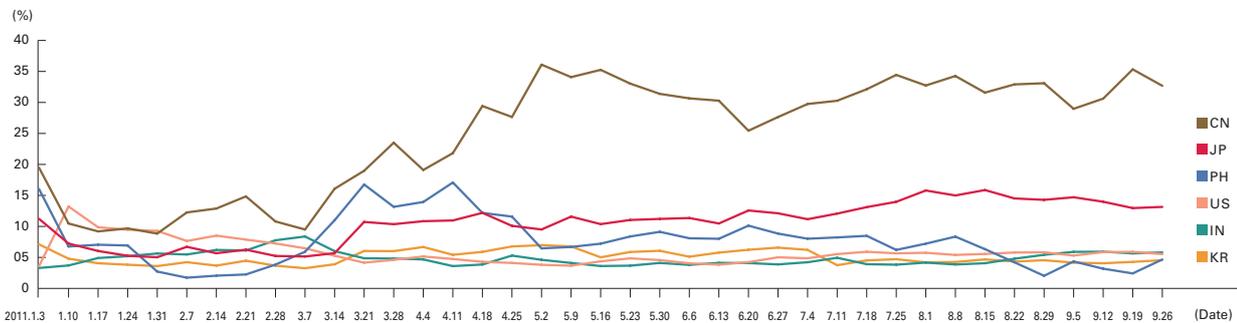


Figure 3: Trends in Ratios for the Main Regional Sources of Spam

\*3 3rd and 4th place both have the same value due to figures being rounded to the first decimal place, but the ratio for the Philippines (PH) is actually higher.  
 \*4 Internet Society of China, <http://www.isc.org.cn/english/>  
 \*5 OP25B (Outbound Port 25 Blocking) is technology that blocks access to port 25, which is used by MTAs (Mail Transfer Agents), from dynamic IP addresses used for the Internet connections of consumers. It is an effective measure for suppressing the sending of spam on your network.

### 2.3.1 SPF Sender Implementation Status

Figure 4 shows SPF authentication result ratios for email received during the current survey period (July to September 2011). 43.2% of authentication results showed “none,” indicating that the sender domain did not declare an SPF record. This was a drop of 3.3% compared to the previous survey. This indicates that the mail sender adoption rate increased by 3.3% based on the volume of mail sent. Though there is some variation, sender adoption rates are increasing consistently. SPF, which is easy for senders to implement, is expected to continue to spread as a key technology for mail systems.

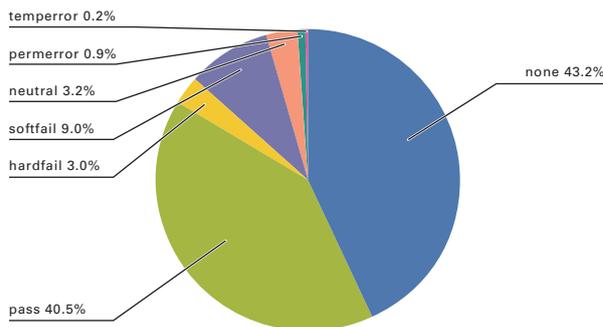
### 2.3.2 Global Penetration Rates

The implementation of sender authentication technology in Japan has reached the practical application stage, with a focus on sender SPF in particular. However, because email is an Internet-based global communication system, it is not enough for this technology to spread in Japan alone. Lars Eggert\*6 of the Nokia Research Center conducts and publishes surveys on the global penetration of technologies such as SPF and DKIM on a regular basis.

The surveys target the most popular website domains in each region (covering 500 domains in Japan). As of September 30, SPF\*7 penetration was 52.8% in Japan, 60.2% in the United States, 57.8% in South Korea, 52.4% in the United Kingdom, and 42.4% in Germany. It may appear from these results that penetration in Japan is about average, but it is not that high compared with the overall global Internet penetration of 61.0%. Similarly, while DKIM\*8 penetration is 10.2% in Japan, it is 33.6% in the United States. 13.1% in South Korea, 22.4% in the United Kingdom, 15.4% in Germany, and 25.7% globally, with Japan trailing behind in each case. With the relatively easy to implement SPF authentication only being adopted by about half of senders, it is possible there is a lack of awareness about SPF itself. We will strive to raise awareness and increase penetration through a variety of organizations.

## 2.4 Conclusion

The IETF (Internet Engineering Task Force) DKIM (DomainKeys Identified Mail) Working Group concluded their activities upon releasing RFC6376 as a revision of the existing RFC4871 and the revisions in RFC5672, and at the same time releasing RFC6377, which summarizes operations regarding the relationship between DKIM and mailing lists. However, there are still parts of DKIM that do not fit in with a number of forms of mail utilization that are now in widespread use. The IETF continues to conduct activities related to sender authentication technology, such as initiating discussions regarding MARF (Messaging Abuse Reporting Format) and reputation. We will continue to participate in these discussions, and make improvements so that email will endure as a tool for better communications.



**Figure 4: SPF Authentication Result Ratios**

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Mr. Sakuraba is a Senior Engineer in the Application Service Department of the IJ Service Division. He is engaged in the research and development of messaging systems. He is also involved in various activities in collaboration with external related organizations for securing a comfortable messaging environment. He is a MAAWG member and JEAG board member. He is a member of the Anti-Spam mail Promotion Council (ASPC) and administrative group, as well as chief examiner for the Sender Authentication Technology Workgroup. He is also a member of Internet Association Japan’s Anti-Spam Measures Committee. He is a member of the Ministry of Internal Affairs and Communications’ Unsolicited Mail Measure Working Group.

\*6 <https://fit.nokia.com/lars/>

\*7 SPF Deployment Trends (<https://fit.nokia.com/lars/meter/spf.html>)

\*8 DKIM Deployment Trends (<https://fit.nokia.com/lars/meter/dkim.html>)