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Supplement 6

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SERIES X: DATA NETWORKS, OPEN SYSTEM COMMUNICATIONS AND SECURITY

ITU-T X.1240 series – Supplement on countering spam and associated threats

ITU-T X-series Recommendations – Supplement 6

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Supplement 6 to ITU-T X-series Recommendations

ITU-T X.1240 series – Supplement on countering spam and associated threats

Summary

Supplement 6 to ITU-T X-series Recommendations states that in order to deal effectively with spam, governments need to employ a variety of approaches, including effective laws, technological tools, and consumer and business education. This supplement reviews the international forums where the issue of spam is being addressed. As a case study, for illustrative purposes, it provides some information about the way the U.S. and Japan have approached the spam problem.

Source

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FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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Supplement 6 to ITU-T X-series Recommendations

ITU-T X.1240 series – Supplement on countering spam and associated threats

1 Scope

The topic of this supplement is spam and associated threats. This supplement is intended for national administrators who are newcomers to the concept of spam and would like some basic information about it.

This supplement looks at the tools that need to be employed to combat spam effectively and describes the work that some international forums are doing in this area. It provides, as a case study and for illustrative purposes, a description of what the U.S. and Japan are doing to combat spam.

2 References

None.

3 Definitions

This supplement defines the following terms:

3.1 phishing: An attempt to fool an individual into going to the wrong website with the intent of stealing that individual's private information.

3.2 spam: Although there is no universally agreed definition of spam, the term is commonly used to describe unsolicited electronic bulk communications over e-mail or mobile messaging (SMS, MMS).

4 Abbreviations and acronyms

This supplement uses the following abbreviations:

ADSP	Author Domain Sending Practices
APEC TEL	Asia-Pacific Economic Community – Telecommunication and Information Working Group
CAN-SPAM	Controlling the Assault of Non-Solicited Pornography and Marketing Act of 2003 (U.S.)
CNSA	Contact Network of Spam Authorities (European Union)
DKIM	Domain Keys Identified Mail
FCC	Federal Communications Commission (U.S.)
FTC	Federal Trade Commission (U.S.)
ISP	Internet Service Provider
JEAG	Japan Email Anti-abuse Group (Japan)
LAP	London Action Plan
MAAWG	Messaging Anti-Abuse Working Group
MMS	Multimedia Messaging Service
MSCM	Mobile Service Commercial Messages

OECD	Organisation for Economic Co-operation and Development
OP25B	Outbound Port 25 Blocking
SMS	Short Messaging Service
SPF	Sender Policy Framework

5 Conventions

None.

6 Background

6.1 **Spam** has gone from being nuisance communications containing commercial advertisements to a facilitator of a more serious cybersecurity problem. For example, spam can be a vehicle for deception, spreading malware such as viruses and spyware, and inducing consumers to provide confidential information that can later be used to commit identity theft (i.e., phishing). Spammers take advantage of the fact that they can send their messages from anywhere in the world to anyone in the world at an extremely low cost to themselves. This makes spam an international problem that must be addressed through international cooperation.

6.2 **Phishing** takes advantage of the fact that, due to a basic characteristic in the Internet's e-mail system[1], anyone can send e-mail to anyone with almost no form of authentication. Phishing is an attempt to fool someone into going to the wrong website with the intent of stealing that individual's private information. Phishing exists in large part because sometimes people expect to receive e-mail from a popular site and they simply do not realize that the mail is not from the legitimate site. Because there is little authentication in e-mails, it is difficult to determine whether a message is legitimate without careful inspection of the message. Such careful inspection requires substantial knowledge of the underlying mechanisms used on the web.

Phishing also exists because most people find it difficult to verify that the websites they are going to are legitimate. Sometimes we do not look closely at the URL of a web page before entering sensitive information, and sometimes we just do not know what the correct URL should be.

The web servers used to "phish" sensitive information are often themselves the victims of malware, making it again extremely difficult to track phishers.

6.3 **Malware**, or malicious software that is made to run on a device without the knowledge or permission of the owner, is also a substantial problem.

7 National approaches to deal effectively with spam and associated threats

7.1 **National strategy and spam**: With respect to a national strategy, countries should develop and maintain a combination of effective laws, law enforcement authorities and tools, technological tools and best practices, and consumer and business education to effectively deal with spam.

7.2 **Legal and regulatory foundation and spam**: With respect to a legal foundation and regulatory framework, authorities that have jurisdiction over spam must have the necessary authority to investigate and take action against violations of laws related to spam that are committed from their country or cause effects in their country. Authorities that have jurisdiction over spam should also have mechanisms to cooperate with foreign authorities. Requests for assistance from

[1] The Internet e-mail system was designed in the 1970s when access to the Internet was limited to very few researchers and government members. There was no need to authenticate the identity of individuals sending e-mail, and therefore no effort was made to design the system to do so. While the e-mail system has evolved since then, this basic omission has been present ever since.

foreign authorities should be prioritized based on areas of common interest and in cases where significant harm occurs.

7.3 Government-industry collaborations and promotion of national awareness of spam and associated threats: All interested persons, including enforcement authorities, businesses, industry groups, and consumer groups should cooperate in pursuing violations of laws related to spam. Government enforcement agencies should partner with industry and consumer groups to educate users and promote information sharing. Government enforcement agencies should cooperate with the private sector to promote the development of technological tools to fight spam, including tools to facilitate the location and identification of spammers.

Phishing is often a preventable crime. Governments should work together with the private sector to improve means of protecting citizens from phishing, and educating consumers and businesses on safe authentication methods.

Governments can also play a role in educating the public on the need to keep malware in check by making use of tools such as anti-virus software and by applying the latest operating system patches and trusted computing techniques.

8 International (multilateral) countering spam initiatives

Several multilateral fora are working on initiatives to combat spam. These include:

8.1 London Action Plan

The U.S. Federal Trade Commission (FTC) and the U.K. Office of Fair Trading hosted an International Spam Enforcement Conference in London in 2004, which led to the creation of a London Action Plan on international spam enforcement cooperation (LAP). As of July 2008, government agencies and private sector representatives from more than 25 countries have endorsed the plan. The LAP encourages interested parties, including spam enforcement agencies and private sector stakeholders, to consider applying for membership in the organization.

The purpose of the LAP is to promote international spam enforcement cooperation and address spam related problems, such as online fraud and deception, phishing, and dissemination of viruses. The LAP builds relationships among these entities based on a short document that sets forth a basic work plan for improving international enforcement and education cooperation against illegal spam. This document is non-binding, asking participants only to use best efforts to move the work plan forward. http://londonactionplan.org/

Since its inception, the LAP has held annual workshops, typically in conjunction with the European Union's Contact Network of Spam Authorities (CNSA). In October, 2007, the LAP and CNSA co-located their annual joint workshop with the Messaging Anti-Abuse Working Group (MAAWG) conference in Arlington, Virginia, which facilitated increased law enforcement cooperation with the private sector. In October 2008, the LAP and CNSA co-located their annual joint workshop with Eco's 6th German Anti-Spam Summit in Wiesbaden, Germany.

8.2 OECD Spam Toolkit and Council Recommendation on Spam Enforcement Cooperation

In April 2006, the OECD Spam Task Force released an Anti-Spam "Toolkit", which contains recommendations to help policy makers, regulators and industry players orient their policies relating to spam solutions and restore trust in the Internet and e-mail. The Toolkit contains eight elements, including anti-spam regulation, industry driven solutions and anti-spam technologies, education and awareness, and global cooperation/outreach. Recognizing that international cooperation is key to combating spam, the OECD governments also approved a "Recommendation on Cross-Border Co-operation in the Enforcement of Laws against Spam", which urges countries to

ensure that their laws enable enforcement authorities to share information with other countries and do so more quickly and effectively. http://www.oecd-antispam.org/sommaire.php3.

8.3 APEC TEL Symposium on spam

In April 2006, APEC TEL held a symposium on "Spam and Related Threats" that brought together thirty speakers and panelists to discuss the evolution of the spam problem and establish a common agenda of action for the TEL. The main topics addressed included:

1) the development and application of national anti-spam regulatory regimes, including enforcement and codes of practice;
2) the role of industry in combating spam, including government-industry collaboration;
3) technical responses to spam;
4) cross-border cooperation and enforcement, including the Council of Europe's Convention on Cybercrime and the OECD Council Recommendation on Enforcement Cooperation as primary tools for enhancing cooperation; and
5) the need for targeted consumer education and awareness raising.

Concrete steps the TEL agreed to take going forward included:

1) encouraging information sharing on regulation and policy, drawing on resources such as the OECD Spam Toolkit;
2) developing a contact list for APEC spam authorities to augment similar resources developed by the OECD and the ITU;
3) encouraging economies to apply for membership in voluntary cooperation forums such as the London Action Plan or the Seoul-Melbourne Agreement;
4) cooperating with the OECD on information sharing and guidance-related initiatives; and
5) supporting capacity building for developing economies to better deal with spam.

9 Case study of some activities to counter spam

This clause presents activities for countering spam in some countries.

9.1 United States

9.1.1 Laws establishing requirements for those who send commercial e-mail (CAN-SPAM Act)

In 2003, the United States enacted the "CAN-SPAM Act", which establishes requirements for those who send commercial e-mail, spells out penalties for spammers and companies whose products are advertised in spam if they violate the law, and gives consumers the right to ask e-mailers to stop spamming them.

The main provisions of the CAN-SPAM Act include the following:

- **It bans false or misleading header information**: Your e-mail's "From", "To", and routing information – including the originating domain name and e-mail address – must be accurate and identify the person who initiated the e-mail.
- **It prohibits deceptive subject lines**: The subject line cannot mislead the recipient about the contents or subject matter of the message.
- **It requires that your e-mail give recipients an opt-out method**: You must provide a return email address or another Internet-based response mechanism that allows a recipient to ask you not to send future e-mail messages to that e-mail address, and you must honour the requests. You may create a "menu" of choices to allow a recipient to opt out of certain types of messages, but you must include the option to end any commercial messages from

the sender. Any opt-out mechanism you offer must be able to process opt-out requests for at least 30 days after you send your commercial e-mail. When you receive an opt-out request, the law gives you 10 business days to stop sending e-mail to the requestor's e-mail address. You cannot help another entity send e-mail to that address, or have another entity send e-mail on your behalf to that address. Finally, it is illegal for you to sell or transfer the e-mail addresses of people who choose not to receive your e-mail, even in the form of a mailing list, unless you transfer the addresses so another entity can comply with the law.

- **It requires that commercial e-mail be identified as an advertisement and include the sender's valid physical postal address**: Your message must contain clear and conspicuous notice that the message is an advertisement or solicitation and that the recipient can opt out of receiving more commercial e-mail from you. It also must include your valid physical postal address.

The U.S. Federal Trade Commission (FTC) is authorized to use its civil law enforcement authority to enforce the CAN-SPAM Act and to obtain civil penalties of up to USD 11'000 per violation. Since 1997, when the FTC brought its first enforcement action targeting unsolicited commercial e-mail, or "spam", the FTC actively has pursued deceptive and unfair spam practices through 94 law enforcement actions, 31 of which targeted violators of the CAN-SPAM Act.

CAN-SPAM also gives the Department of Justice the authority to enforce its criminal sanctions. The CAN-SPAM Act provides for significant criminal penalties, including jail time for spammers. Other federal and state agencies can enforce the law against organizations under their jurisdiction, and companies that provide Internet access may sue violators, as well.

9.1.2 Rules prohibiting sending commercial e-mail to wireless devices

The United States also has adopted rules to protect consumers from receiving unsolicited commercial messages (spam) on their wireless devices. With some exceptions, the rules prohibit the sending of commercial electronic mail messages, including e-mail and certain text messages, to wireless devices such as cell phones. The rules apply only to messages that meet the definition of "commercial" used in the CAN-SPAM Act – and to those messages where the main purpose of the message is a commercial advertisement or to promote a commercial product or service. Non-commercial messages, such as messages about candidates for public office or messages to update an existing customer about his or her account, are not subject to the rules.

Mobile service commercial messages (MSCMs) include any commercial message sent to an e-mail address that has been provided by a mobile service provider of a subscriber's wireless device. MSCMs are prohibited unless the individual addressee has given the sender express prior authorization (known as an "opt-in" requirement). The rule prohibits sending any commercial messages to addresses that contain domain names that have been listed on the FCC's list for at least 30 days or at any time prior to 30 days if the sender otherwise knows that the message is addressed to a wireless device. To assist senders of commercial messages to know which addresses belong to wireless subscribers, the rules require that wireless service providers supply the Federal Communications Commission (FCC) with the names of the relevant mail domain names. Short messaging service (SMS) messages transmitted solely to phone numbers are not covered by these protections. Auto-dialled calls are already covered by other laws.

Under the FCC's rules, the FCC can impose monetary forfeitures against spammers ranging from up to USD 11'000 per violation for non-licensees and to up to USD 130'000 per violation for common carrier licensees. In addition to monetary penalties, the FCC can issue a cease and desist order against a spammer that has violated any provision of the Communications Act or any FCC rule authorized by the Act. In addition, under the Communications Act, anyone who violates a provision of the Act is subject to criminal prosecution by the Department of Justice (in addition to a monetary penalty), and may face imprisonment for up to 1 year (up to 2 years for repeat offenders). To date, the FCC has not initiated any enforcement proceedings related to such commercial messages.

9.1.3 Approaches to limit phishing

As was discussed above, a basic premise that spammers and phishers count on is the lack of knowledge regarding who the sender is. The Internet Engineering Task Force (IETF) has released two standards, Domainkeys Identified Mail (DKIM) signatures [b-IETF RFC 4871] and DKIM Author Domain Sending Practices (ADSP) [b-IETF RFC 5617] that improve a recipient's ability to identify senders. Vendors have begun to make implementations available to customers. There is also at least one free[2] implementation of the standard available. A source for assistance is the Anti-Phishing Working Group (APWG), an industry association focused on eliminating the identity theft and fraud that result from the growing problem of phishing and e-mail spoofing. The organization provides a forum to discuss phishing issues, trials and evaluations of potential technology solutions, and access to a centralized repository of phishing incidents http://www.antiphishing.org.

This standard enables "white list validation", or the ability to verify that, for example, it really is your bank or your friends or associates that are trying to reach you. This standard in and of itself will limit some forms of phishing, but not all.

9.2 Japan

9.2.1 Law enforcement

There are two laws to restrict e-mail sending in order to suppress e-mail spam in Japan. The main elements of these laws are as follows.

– The following rules apply to sending advertisement messages using e-mail. (Opt-in)
  - Sending advertisement messages using e-mail, without the recipients' consent to receive them, is prohibited.
  - The sender organization is required to keep evidence of consent from the recipients while sending the advertisement messages to the recipients.
  - The advertisement messages need to provide information about the procedure to stop sending the advertisement message, sender's name, etc.
  - If the recipient uses the correct procedure to notify the organization that it does not want to receive advertisement messages, the organization cannot send any more advertisement messages to the recipient.

– Sending e-mail messages with faked sender information, such as e-mail address, IP address and domain name, is prohibited.

– Sending e-mail messages to fictitious recipient addresses automatically generated by a computer program is prohibited.

9.2.2 Council for Promotion of Anti-Spam Measures

A wide range of concerned parties such as ISPs, advertisers, ASPs for delivering ad-mails, security vendors, consumer organizations, administrations, etc., organized the Council for Promotion of Anti-Spam Measures in 2008. The council adopted a "Declaration toward Eradication of Spam" in November 2008.

[2] "Free" here refers to the ability to implement this feature royalty-free under conditions specified by the patent holder.

9.2.3 Cyber Clean Centre (CCC)

The Cyber Clean Centre (CCC), which finds PCs infected by bot, was established after the close collaboration among the Japanese government, ISP related organizations and major ISPs. This centre works as follows:

– The CCC manages a large scale honey pot system, which receives infection activities from malware (usually bot) infected PCs. The honey pot system collects IP addresses of infecting PCs and program codes of malware (bot).

– Lists of IP addresses and the date/time they were detected are sent to each ISP. Each ISP identifies its subscribers with these IP addresses and informs them that their PCs may be infected by malicious software. Each ISP also sends them the information about CCC (link to the web page) and disinfection software.

– The CCC analyses the collected program codes. If the program code is a previously unidentified one, new disinfection software which can disinfect this new malicious program code is made and released.

This activity contributes to repression of bot infection activities in Japan. Because most spam mail messages are sent from the bot infected PCs, this also contributes to decrease spam mail sending from Japan.

9.2.4 Outbound Port 25 Blocking (OP25B)

When ISP subscribers send and receive e-mail messages, they use an e-mail service that is provided by the ISP in general. So the subscribers send their e-mail messages to the ISP's mail servers, and the ISP's mail servers relay the messages to destination e-mail servers. ISP subscribers do not normally send their e-mail messages directly to the destination e-mail servers. Because bot or virus infected PCs send spam mail directly to the e-mail servers of the destination address, such e-mail messages do not pass through the ISP's mail servers. If the communications from subscribers' PCs that bypass the ISP is network using SMTP (TCP with destination port number 25) can be stopped, many spam messages can be blocked. Therefore, the Japanese government, ISPs and the related organizations investigated the following issues in close cooperation with each other:

– impact to subscribers when the TCP of outbound port 25 blocking (OP25B) [b-MAAWG MP25] is introduced;

– restrictions on blocking specific communications under current Japanese laws.

After these investigations, many ISPs apply the OP25B under the following activities. JEAG (Japan Email Anti-abuse Group) plays an important role in this process by publishing a recommendation to ISPs to urge introducing OP25B.

– Although the introduction of OP25B is not mandatory for Japanese ISPs, 52 ISPs, including almost all major ISPs, have introduced the OP25B by July 2009.

– Many ISPs introducing the OP25B provide TCP port 587 with SMTP AUTH, as an alternative way to communicate, so as not to decrease service quality. Users can submit mail messages from other ISPs by adapting OP25B to such ISP's mail server.

9.2.5 Sender authentication technologies

Sender authentication technologies are techniques to detect source address spoofing of e-mail. JEAG published a recommendation to introduce these techniques, and the Ministry of Internal Affairs and Communications published the document "Important legal matters concerning the introduction of sender authentication at the receiving side by an ISP". Currently almost all major mobile communication operators and some of ISPs have introduced the Sender Policy Framework (SPF) [b-IETF RFC 4408], one of the sender authentication technologies, and their subscribers can use the result of authentication for filtering. The rate of published SPF record for ".jp" domains was

35.99% in August 2009. Moreover, several ISPs have started to introduce DKIM [b-IETF RFC 4871] as additional sender authentication.

9.2.6 Spam mail sender information exchange among mobile communication operators

Almost all cellular phones in Japan have the capability to handle general e-mail messages. Because many spam mail messages are sent from mobile cellular phones in Japan, all mobile communication operators exchange information about spam mail senders with the following steps:

– The ID of any individuals who wish to make a contract for mobile phones is checked under the "Mobile Phone's Improper Use Prevention Act".

– If a mobile communication operator finds a cellular phone user who sends spam mail messages which violate the "Act on Regulation of Transmission of Specified Electronic Mail", the user information is provided to all other mobile communication operators.

So, if a user sends spam mail messages from a cellular phone, the user will have difficulty in subscribing a contract for mobile phone usage in Japan.

A related non-profit organization sets sensors, collects spam messages and analyses them. It provides information about spam mail senders to originating ISPs in Japan and exchanges this information with some agencies in foreign countries.

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