Spam: One Puzzled Problem for E-Commerce

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Abstract E-commerce has advantages of low bargaining cost, full field service, and convenient. Its development forms and promotes the key factor of the global economic growth, and the security problem of e-commerce becomes more and more important thereupon. It is the subject of a great meaning to structure the safe, convenient e-commerce running environment. The task of anti-spam is a concrete content among them. This paper discusses the source and danger of spam, and the precautionary and radical cure measures of spam are put forwarded, and the technologies of the anti-spam are discussed especially.

Key words e-commerce security; spam; technologies of anti-spam

E-commerce means utilizing the approach of swift, convenient, low cost telecommunication to carry on various kinds of commercial activity, and participators without meeting each other[1]. As one brand-new commercial operation mode, E-commerce has advantages of low transaction cost, comprehensive service and convenience. Just these advantages form people’s confidence towards such new commercial operation mode, more and more companies and individuals conduct business activities through Internet. The development prospect of e-commerce is very captivating, and the security problem of commercial affairs has become more and more important. How to structure one safe, convenient commercial running environment is a subject that has great significance. The anti-rubbish mail is a concrete content among them. According to the 13th statistical report of China Internet Network Information Center (CNNIC), by 2004, number of netizens reach 79.5 million in china, it is 5.8 legal E-mail that the Internet users received per week on average, but the spam netizens received are 7.9 per week[2]. The rubbish mail that users receive every week far exceeds the legal mail. And the rubbish information like the flood in Internet has attacked people’s confidence to use E-mail; rubbish mail has already become obstacles- which baffles the development of e-commerce. The task of recognizing, preventing and controlling the rubbish mail has great meaning to the development of e-commerce.

1 The Definition and Source of the Rubbish Mail

At present, because of the imperfect anti-spam legislation of our country, experts also do not have an academia definition for the rubbish mail. But the comparatively generally acknowledged definition is just as “Norm of Anti-Rubbish Mail of Internet Society of China” defined in Ref.3[3]. the rubbish mail this norm referred to including the following attributes of electronic mail: (A) E-mail of advertisement, electronic publication, different forms of propaganda materials which receivers do not request beforehand or accept to receive. (B) E-mail which addressee can't dishonor. (C) E-mail which hides the necessary information such as addresser’s identity, addresser’s IP address, title of e-mail (D) E-mail With false information source, addressee, route, etc.

The origin of the rubbish mail can be traced back to 1994, it is an American couple that first introduced the practice of making spam, they sent advertisement matter with immigrant’s consultant content to about 6000 users, which is called “visa incident” in history.
From then on, rubbish mail is growing out of control. Because of disguise and uncertainty of rubbish mail, data that come form many ways demonstrate that rubbish mail grows rapidly, overflow on Internet. This situation brings heavy pressure and severe challenge to e-commerce, which survival and development relied on Internet. The source of the rubbish mail has some following reasons mainly:

1) Mail transfer protocols adopted presently have natural inadequate faults[4]. The initial designed goal of protocols is that “network interconnected”, only confined to the use of academia, with the purpose to offer convenience for academic exchange. But with the development of Internet, until now, network environment has many changes taken place; the atmosphere of network is to pursue the economic benefits mostly.

2) E-mail makes the communication among people conveniently, and the cost is cheap. Enormous business opportunities are being hidden behind the advantages of this convenience and low cost. Some companies and individuals utilize the E-mail system to send the commercial advertisement to users under the drive of the commercial interest. What is more, someone collects e-mail address on Internet through various kinds of methods, and get benefits by reselling e-mail address or sending rubbish mail for trade companies. In “visa incident”, rubbish mail makers who first introduced the practice of making rubbish mail made a profit about 200 000 dollars, and the cost could nearly be ignored.

3) Development and popularization of network make computer viruses to travel extensively on network possible. Nowadays a lot of computer viruses have the characteristic of networks. Because the e-mail system has advantages such as convenience, low cost, and owns numerous users, e-mail system often becomes first selected platform by “hacker” to propagate computer viruses. For example, notorious “shock wave” virus propagated through the e-mail system. This virus will search for the E-mail address automatically, and then it will send the virus mail according to the E-mail address searched for automatically after finding, it is very harmful.

2 Harm of Rubbish Mail to E-commerce

Rubbish mail pollutes e-commerce running environment seriously, form threats to e-commerce security, but also has become a serious social problem day by day. The harm mainly shows in the following four ways:

1) Waste social resources. Rubbish mail takes a large number of network resources, system resource, ties up a large amount of bandwidth, and has bad influence on transmission efficiency of the network. Even serious situation is to block network, influence the normal running of the network.

2) Waste social wealth. Internet service provider (ISP), such as AOL, Yahoo and Hotmail, among the e-mails dealt with, the quantity of rubbish mail has already over half. Only consider how to deal with these rubbish mails will spend a large amount of manpower and money. The statistics show that, in whole world enterprises spend about 8 billion to 10 billion to solve rubbish mail problem annually, U.S.A., up to 87 billion dollars loss every year because of rubbish mail[5].

3) A factor influences the social stability. A lot of rubbish mails contain and advocate unhealthy contents, such as violence, pornography, etc. All of these cause pollution to people’s physical and mental health. Some foreign hostile force and illegal organization (such as Falun Gong) utilize network to send users a large number of rubbish mail with reactionary, demagogic content. It is a great hidden danger of influencing the social stability.

4) Influence the security development of e-commerce. At present, Because of our country’s imperfect anti-rubbish mail legislation and technologies of anti-rubbish mail do not work effectively, a lot of E-commerce enterprises’ mail servers become transfer station of rubbish mail, a lot of IP addresses are listed in “the blacklist” by some anti-rubbish mail organizations and network operators
in the world, what worse is that, be shielded. Influence our country’s normal e-commerce running environment seriously, thus caused a lot of inestimable losses.

3 Technologies of the Anti-Rubbish Mail

Rubbish mail has serious harm like pestilence on Internet. The action of anti-rubbish mail is imperative. One traditional method is to develop the technologies of the anti-rubbish mail. At present, technologies extensively used are as follows. 3.1 Technology of Realtime Blackhole List (RBL)

This Technology is to put rubbish mail maker’s IP address in a tabulate (called black list) in which IP address can be suitable for inquiring. Blacklist is provided by international organization (such as MAPS, PRBS, SpamCop, etc.) of prestige. Judgment is made through the approach of inquiring DNS whether an IP address of addresser is among the blacklist, if the answer is true, then a judgment of rubbish mail is made, and the mail is shielded; otherwise released. Because mail server is often busy in dealing with and transmitting a large number of e-mails, and the inquired result requires instant, so DNS inquires of mail server are very frequent, so the load of the mail server is overweight, result in responding slowly. Under this situation, people can use DNS district transmitted, that is to convey RBL of the blacklist server to local DNS server, inquiring of RBL served by local DNS server directly.

3.2 The Technology of Mail Filters

Generally, the e-mail has the following essential features: mail head, addresser, addressee, the mail subject and mail content. These characteristics are the basis of filter technology to judge, analyses, statistic, distill and filter. Technology of Bayesian algorithm based on statistical analysis is adopted mainly at present.

3.3 Technology of the Mail Server Disposes Safely

Rubbish mail from sending to receiving, transmitted by several mail servers often. Through disposing the mail server safely, people cut off the spread channel of the rubbish mail; therefore reduce the quantity of the rubbish mail effectively.

1) Restraine the mail system’s function open-relay. In early times of Internet, there are only a few mail servers in network; much mail is need to be transmitted via several mail servers. So early mail system’s function of open-relay is set up to be open acquiesced. But this function gives green light to propagate extensively for rubbish mail while brings convenience for users. Thus, restrain the mail server’s open-relay function and refuse every request for local SMTP service that comes from IP address out of range of mail server’s management without exception.

2) Authentication function of e-mail sending. Send the authentication function of mails. Through using SMTP authentication function (SMTP AUTH) of ESMTMP protocol (RFC-2554) to control the addresser, an addresser who passes the authentication may use the mail server to transmit E-mail only. Presently, Most mail systems support functions of plaintext password, MD5 authentication, even authentication based on public key certificate.

3) Mail server’s function of Reverse domain name solution. Because a lot of spam maker use dynamic IP or IP address without registered domain name to send the rubbish mail, in order to prevent IP from being closed down. Open the function of reverse domain name solution function to refuse the transmitting request made by mail which IP address without registered domain name. This method can reduce rubbish quantity of mail greatly like this.

4 Tactics of Anti-Rubbish Mail

The danger of the rubbish mail has been already very serious, and the spam has already become pestilence on Internet. To solve this social problem, people not only take technical method, but also take the method of management. But “as virtue rises on foot, vice rises ten”, the technology of the anti-rubbish mail is being developed, the advanced manufacture rubbish mail technologies emerge in an endless stream too, often the development of technologies of the anti-rubbish mail lags behind the development of the
technologies of manufacturing rubbish mail. So it is very difficult to solve the rubbish mail problem at technological aspect only. To prevent and solve the problem of rubbish mail, the three main forces of network society—the user, IT trade and government should all pay attention to taking action actively, it is necessary to take technologies and management measures of some pertinence.

4.1 As to User

Rely mainly on preventing, do the security work of user's e-mail address well. Users can take the following measures[7]: 1) Does not disclose, register the mail address at will; 2) Does not Subscribe unofficial, unhealthy electronic books and periodicals tabulate at will, in order to prevent the mail address from being collected by person who collects mail address; 3) Owns two or more mail addresses, does not use separately with the use according to different purpose, separately uses e-mail address for private communication, public affair communication, subscribing electronic information, etc., so as to ensure that the communication mail address is not harassed by the rubbish mail.

Adopt existing anti-rubbish mail technology actively. Here are the concrete measures[7]: 1) use the application software to intercept the rubbish mail, there are much such kind application software. For instance: Spam eater, Bounce Spam Mail, AntiSpam, etc. 2) Using the postbox’s function of filtration to set up and dishonor the rubbish mail. This kind of more outstanding customer end software are foxmail5.0, Outlook, etc. 3) when receive rubbish mail, through looking over title of rubbish mail, analyze the source of the mail, and complain to suitable ISP or the network administrator, proposes they to take measures. The tool of the common used to locate IP address has whois, Traceroute, Nslookup, etc.

4.2 As to IT Trade

Can take the following three measures:

1) Adopt riper anti-rubbish mail technology at present to intercept and capture the rubbish mail actively.

2) Research and develop new technology actively.

Presently, there are some methods and technologies still in discussion, for instance: electronic stamp scheme, challenge-reply way, SPF approach, Domainkeys approach, etc[7].

3) Strengthen the independent management of the trades, set up sector standard, establish the social morality of the trade. IT trade can utilize special technology, statistic rubbish mail quantity of the whole country, and announce the rubbish mail “blacklist” yearly at the end of every year, and set up the corresponding sanction standard of the trade, make the rubbish mail maker in “blacklist” become “the target of public criticism”.

4.3 As to Government

1) Accelerate the legislation work of the anti-rubbish mail. At present, the legislation to the anti-rubbish mail of our country is still not perfect. But some countries are suitable for the place drawn lessons from in the world. 26 states have passed the legislation about anti-rubbish mail in U.S.A.; 14 countries, such as Japan, Britain, Canada, etc. have set up corresponding anti-rubbish mail bill too[4]. Adopting legal approach to attack the behavior of making rubbish mail is an effective method to solve the problem that rubbish mail increasing constantly.

2) Strengthen international exchanges and cooperation. Because of the opening of Internet, the domestic and international mail server may become the transfer station of the rubbish mail; utilize the E-mail to swindle internationally emerging in an endless stream. In the aspect of international exchanges and cooperation, U.S.A. has united 29 countries, announced a program that tracked the rubbish makers and Internet Service Providers. This program makes the government be able to carry on the investigation more conveniently even more. All of these have meaning of reference for our government to legislate anti-rubbish mail policy.

5 Conclusions

E-commerce is becoming a new commercial operating mode gradually in the near future, but
because of some defect of Internet design in the aspect of security originally, the security problem of e-commerce is a problem solved primarily. The anti-rubbish mail is only a concrete content in the security problem of e-commerce. Rubbish mail brings user, society bring enormous danger to netizens and society, has become pestilence of Internet already. To prevent and control this “persistent ailment”, besides applying and developing new anti-rubbish mail technology, users, IT trade, the government all of the three sides need to pay attention to this problem, and utilize effective measures, Structure one safe, high-efficient e-commerce running environment. Rubbish mail is not a problem that one enterprise can solve, it has already been evolved into a social problem, and relevant enterprises and users have obligation and responsibility to control the rubbish mail together. To solve the problem of rubbish mail depends on user, IT trade, government, and even cooperation of international community.

References

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