

LENS

Leveraging anti-social Network against SPAM

Abstract

Spam is still an unsolved problem from the network operator's perspective. Most of all emails are spam and it is a lot of work to separate relevant emails from spam.

The state of the art, to employ filters against spam at the recipient's side, couldn't stop spamming.

Our innovative approach works differently. It is based on the confidence of users in a social network. One user trust his friends and his friends trust their friends and so on. → This way we leverage social network structures against spam mails.

Challenge

In 2010 about 89% of all emails were spams, we talking about more than 200 billion spams mails per day and incur a cost of hundreds of billion dollars per year. The state of the art can be differentiated in 4 broad categories:

- a) content-based filtering
- b) sender authentication approach
- c) header-based approach and
- d) social network and trust based approaches.

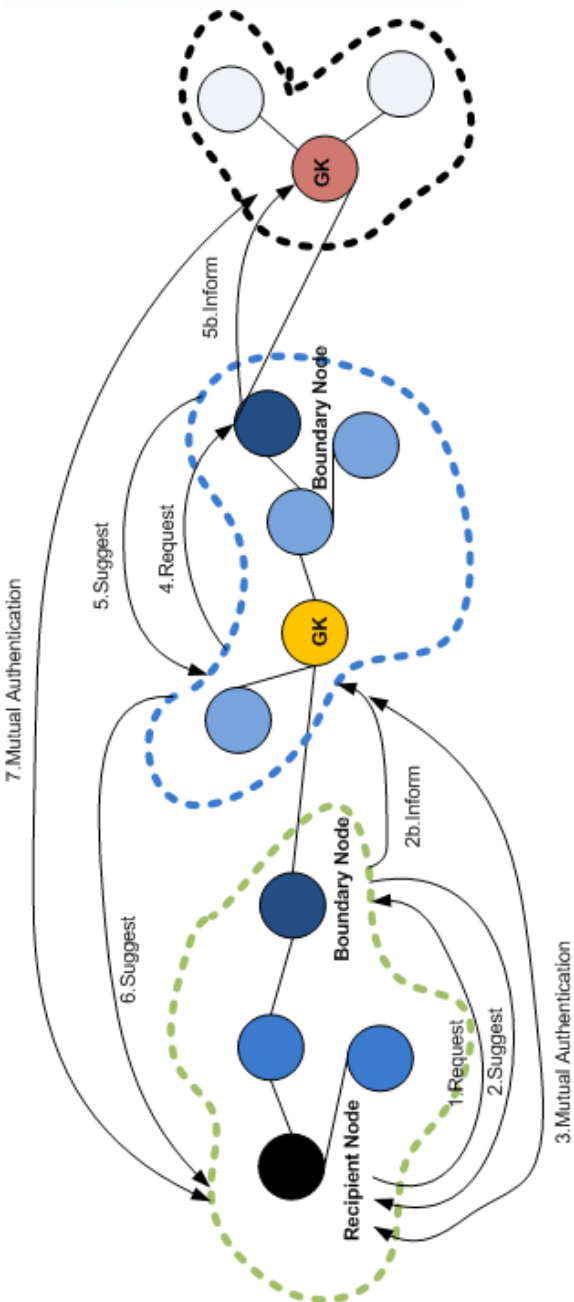
All of these approaches have disadvantages. In short, the spam protection systems used today only filter spam from the user's inbox, but the spam already travels the network, and provokes significant costs to network operators in terms of bandwidth and infrastructure. On the other hand, content-based filtering, one of the most widely adopted defense mechanism, has turned the spam problem into the problem of false positive and false negative mails. In consequence, this makes email delivery unreliable. False negative is when spam is classified as legitimate and placed into the inbox. Whereas false positive filtering can cause serious problems since an important and legitimate email is misclassified and may not be received in time.

Our Solution

We propose LENS, a new spam protection system which leverages anti-social networking paradigm based on an underlying trust infrastructure to both *extend spam protection beyond a user's social circle and fundamentally prevent the transmission of spam across the network at the first place*. For any particular user, LENS handles emails separately in two different ways based on their origins (i.e. within and outside a user's community).

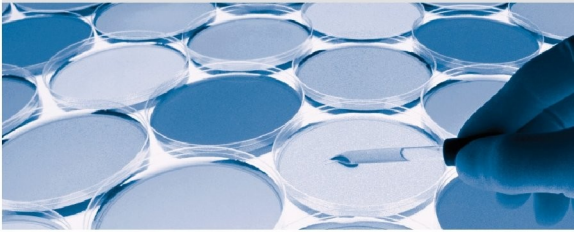
Emails within social network: All the emails generated within the user's community are authorized and trusted to be legitimate messages, and will pass directly into the inbox.

Emails beyond social network: In order to extend spam-free emails beyond a recipient's social network, we introduce a process called anti-social networking for selecting Gatekeepers (Gks), For this a user selects trusted GKs outside its social network. GKs are selected to be socially separated from the user with predefined or user-specified social distances. Once selected, the GKs are used to vouch for all incoming emails outside a recipient's social network.



7. Mutual Authentication

3. Mutual Authentication



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Advantages

- Simple and efficient design
- Decentralized solution
- Leverage knowledge of the network
- Sender address can not be forged
- Privacy of community list information
- Incrementally deployable

Applications

A spam filter system for email provider or social networks.

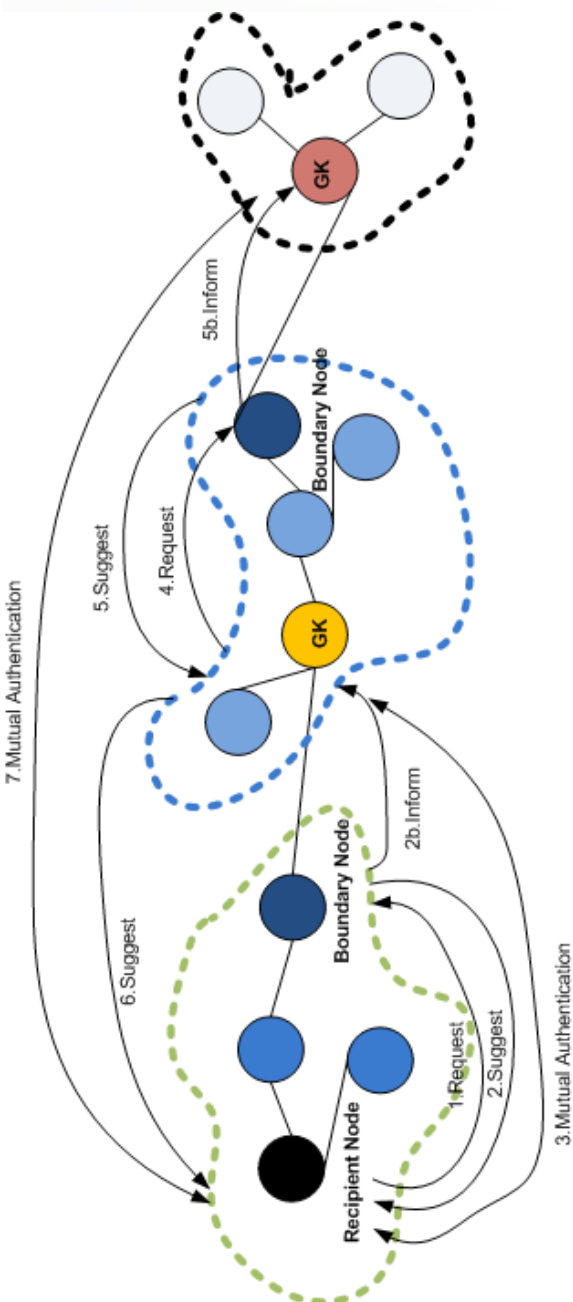
Patent Status

A international patent application (PCT) has been filed.

Development Status

We can demonstrate the scalability of LENS in terms of a number of email users using two popular online social network datasets: Facebook and Flickr. We can show that with the help of hundreds of GKs, a recipient can be possibly reached by millions of users. The solution can be scalably extended to users with larger social distances by iterative GK selection.

We are looking for licensees to commercialize our product.



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