

A Non Scale Free Attribute of Convergent Address Window for Private Messaging

Young S. Han

Department of Information Media, The University of Suwon
yshan@suwon.ac.kr

Abstract

A convergent address window of web browsers accepts a destination address and a message string. The destination address can be domain names or any other form of addresses and is interpreted as the recipient of the message. Once the message is sent to the recipient, a web page associated with the recipient is presented to the message sender through the web browser. The convergent address window helps to avoid the stiff competitions for access opportunities among private web pages whose distribution is characterized by power law. Because messaging among private relations does not compete with one another, message traffic distribution is not extremely biased. Since convergent window can combine messaging and web paging, web paging distribution can also benefit accordingly to the non scale nature of private messaging. Now such convergent address system is supported by major Korean ISPs and is available for commercial applications.

1. Introduction

The number of web pages continues to grow and unlimited competitions for gaining access clicks are principal activity in the web. As a result the distribution of links in the web is a form of power law [1]. Because of the flexibility and efficiency of competition in the web the extreme nature of power law is clearly demonstrated in the web link distributions.

Power law is observed in numerous biological and sociological systems and is positively related with the efficiency of the systems. Socially, however, the impact of power law distribution leads to the side effects that claim pains of majority of the community. This paper suggests a way to improve the distribution of web connections in a specific context.

The address window of web browsers is an input area for the invocation of web pages and the execution of URI schema. Despite the generality of the semantics of the address window, the well known schema available in the address window is about accessing information and resources on line. A convergent address window has an extra scheme that makes it possible to send messages through the window, and thus the window executes the function that deals with live objects which are non online objects.

The connections in the network of private messaging are distributed in bell curves. By relating web pages with the message connections, we can push web pages accordingly to the distribution of message connections. This is a natural side effect of message sending in the address window that issues web pages.

The message events discussed in this paper regards to the operations that involve mobile devices. Messaging from online to a mobile device or between mobile devices is the interest of this study.

In section 2, how the power law governs in web is explained. In section 3, a convergent interface for the address window is introduced, and its side effect with regard to the power law distribution of web will be described in section 4. Conclusive implications of the convergent interface are given in section 5.

2. Power Law and Scale Free Networks

Power law is a kind of polynomial function whose property does not change by scale variances. The particular function is common in many biological and physical systems. Scale free networks are network systems with degree distribution in power law.

Web pages are nodes constituting a world wide web, and the connections correspond to the hyper links. Page accesses through searches and addresses may also be regarded as virtual links. The degree of a web page is the number of access points that can be inbound links or search counts. The degree distribution

of web exhibits the power law and the network is named as “scale free.”

Power law relationship can be defined by the following.

$$P(k) \sim k^{-\gamma}$$

where $P(k)$ is the probability that a node in the network connects with k other nodes was roughly proportional to the inverse of k^γ .

According to Barabasi [1], the sufficient conditions for scale free networks are growth and preferential attachment. As long as the network grows and links with popular nodes are preferred, the network remains scale free. Such scale free networks will contain very popular nodes called hubs and most nodes will be linked in very low degree while only a few nodes will have extremely high degree of connections.

Extreme division of degree distribution can be seen as an unfortunate fact when each node in web networks corresponds to web pages of businesses and individuals. Most web pages will be given little attention. Such extreme nature contributes to the stability and efficiency of systems and gives rise to the formation of order from disorder in many complex phenomena. There seems to be no means to escape or relax the natural law that assumes little success for the majority of the system.

A related study on the linearity of message network can also be found in Han [2] who tries to show that the hubs in the network are linearly distributed.

3. Convergent Address Service

The address window of web browsers is intended to accept resource names and addresses and return ways to access some resources on line that can be web pages or servers. Message service accepts a recipient name and a message body, and then sends the message to the recipient. The address window is a means to access online resources that are mostly inanimate while messaging is to access human resource on line or on mobile. The convergence of the resource access and messaging between users is accommodated into the address window [3].

The address window accepts address of message recipient that can be domain names or any other effective expressions followed by a message string (see figure 1). The entire input string is processed as if it were a URL string and it brings out a side effect of message transmission. The nice thing about the convergent interface is that one operation can be related with two natural outcomes. Users who request message transmission may also expect resource

presentation from the browser because the web browser is meant to return resources upon the input of something to the address window.

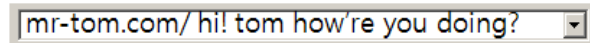


Figure 1. Example of sending a message in an address window.

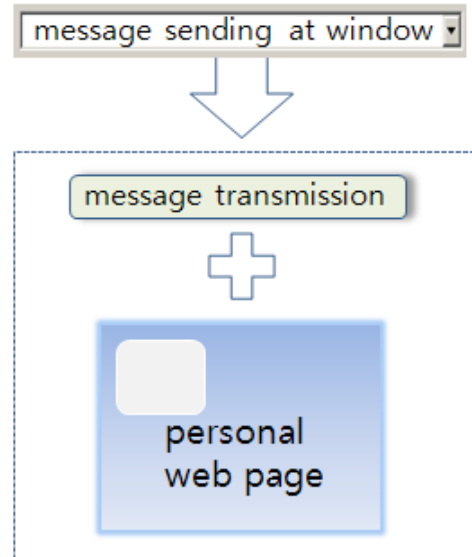


Figure 2. A return key will trigger message transmission and lead to a page view as a natural consequence of the return key.

There are many possibilities on what the resource presented after message sending can be. One simple way is to present the web page of the message recipient. The message sender can send a message to a person associated with an address and at the same time can examine the extra information about the recipient at a cost of one “enter” key (see figure 2).

A nice composition of two major media lays new lights on the understanding of those media and the potential of hybrid media.

4. Overcoming Power Law

The messaging events among people form a network of communication. The topology of the network may or may not resemble that of internet because very few people will be extremely popular but that does not mean most people are extremely unpopular. It is clear that because of the very few

popular people the degree distribution has a very long tail.

The frequency distribution of the message network is somewhat different from the degree distribution. The frequency regards the count of inbound or outbound messages of a node (person) for a given period of time while the degree refers to the number of connections (acquaintances). The notion of this distinction is not found in the studies on the network of internet. According to Han [2], frequency distribution of the message network takes after the bell shape distribution of random networks.

Figure 3 and Figure 4 show the frequency distribution of message network consisting of 98 freshmen belonging to a same class. The students are asked to give the number of message they exchange for a day on the average.

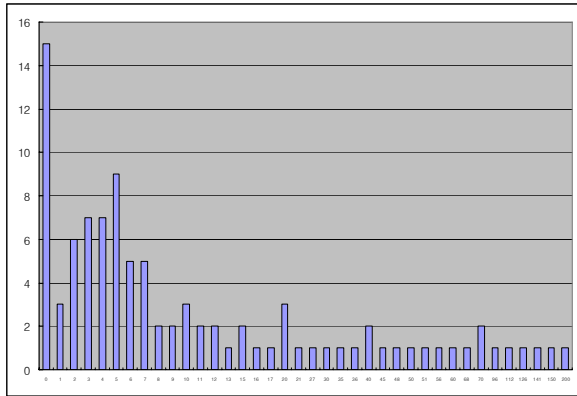


Figure 3. The frequency distribution of outbound messages for 98 students. Y axis shows the number of students and X axis shows the message counts sent for a day on the average.

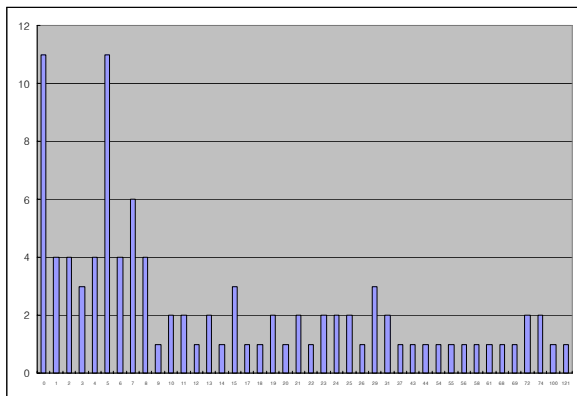


Figure 4. The frequency distribution of inbound messages for 98 students. Y axis shows the number of students and X axis shows the message counts sent for a day on the average.

It is worth mentioning that outbound distribution (see figure 3) is more predictable than inbound distribution (see figure 4). Users have more control in sending messages and relatively less control in receiving messages, which may signify messaging is based on finite resources available for each individual.

Why the frequency distribution of the message network does not follow the power law can be understood in terms of resource dependency of the competition in the network. For the power law to be implemented the competition for link establishments should not be limited.

In the case of message transmissions the inbound/outbound messages are controlled by each person so that the person will not allow messages more than he/she can process due to the limited resources the person needs to handle the messages.

We assume that the network of blogs and personal web pages is consistent with more comprehensive online networks and that the network is scale free obeying power law. The assumption is safe because sufficient conditions for scale free networks are met by the network of personal web pages as it keeps growing and the links are generated by the popularity of web pages.

Theory 1: The access frequency distribution of a network of private web pages is not guaranteed to be scale free when the web pages are allowed to be accessed accordingly to the distribution of message communications.

Proof: Links or accesses to web pages can be made through the events of messaging that is not based on popular selections. The failure to select access pages by popularity violates the second condition of scale freeness.

Depending on the volume of message traffic the network of private web pages will take varying shape of distributions of access frequencies whose nature is not scale free any longer.

5. Conclusions

A network of nodes with growth and competition is called a scale free network that preserves power law relation. On the other hand, a network of message exchanges fails to establish the necessary conditions required to be qualified as a scale free network. If pumping web pages takes place in the line of message traffic the distribution of access frequencies in the web page network cannot maintain the power law relation any longer.

For the joint event of messaging and web page access to be naturally coordinated, a convergent interface using address window is shown to be an effective medium. This proves a meaningful convergence of two functions produces more than mere sum of them.

As in this heading, they should be Times 11-point boldface, initially capitalized, flush left, with one blank line before, and one after.

6. References

- [1] Albert L. Barabasi. Linked. A Plume Book. 2003.
- [2] Young S. Han. Linearity Property of SMS network Clusters. Fall Proceedings in KISS. 2006.
- [3] www.jumhangul.com, a convergent address window service. 2007.