

Toward Trusted Internet: a Stepwise Approach to Improve Cybersecurity

Youki Kadobayashi
Nara Institute of Science and Technology

Cybersecurity landscape today is experiencing rapid changes, due to technological innovations, new threats, and new legislations. The situation has, however, only become complicated and worse, despite the growing number of both legal and technological tools. We argue that the fundamental challenge remains to be addressed; there has to be a stepwise approach to improve cybersecurity, and the Internet architecture itself should be renovated, harnessed, or reinvented in order to address this problem. We describe our research activities toward the realization of trusted Internet, along with related research activities in Japan.

The cybersecurity problem can be captured from a variety of perspectives, some of which will be addressed in this talk. First, we argue that the lack of responsibility in cyberspace is the source of malicious activities. Many types of communication mediums in cyberspace employ pseudonyms or anonym, sometimes with intentional detachment of responsibility, which makes it difficult to identify adversaries once malicious software are identified in such communication mediums. We then describe our research efforts to tackle this problem.

Second, we discuss accountability in cyberspace. Today we have many tools to identify malicious software and cyber-attacks, but we are yet to come up with efficient methodologies or tools to uncover root causes and the development process of threat. We then describe our national research program that will eventually address part of this problem.

Third, we argue that incentive mechanisms are critical for the realization of trusted Internet. We illustrate variety of means to harness the Internet architecture, and then discuss how incentive mechanisms can be employed among interested parties to form, and enlarge, a bigger circle of trust in cyberspace.

Keywords: *cybersecurity, responsibility in the cyberspace, trusted Internet*