Characterizing the Running Patterns of Moving Target Defense Mechanisms

Guilin Cai, Baosheng Wang, Yuebin Luo, Sudan Li, Xiaofeng Wang

College of Computer, National University of Defense Technology, Changsha, China

cc_cai@163.com, wangbaosheng@126.com, luoyuebin@nudt.edu.cn, nudtlsd@163.com, xf_wang@ nudt.edu.cn

Abstract—**Moving Target Defense (MTD) has been proposed as a game-changing theme to increase the work effort to attack as well as the security of target system. There has been proposed a multitude of MTD mechanisms. Generally, these mechanisms follow some fundamental running patterns which determine their functionalities. In this paper, we introduce three main schools of thought on MTD mechanisms systematically and categorize the related works according to them. Then we identify and define three fundamental running patterns exhibited by these MTD mechanisms. Thereafter, we use five MTD mechanisms, which belong to the three schools of thought, as cases to confirm the patterns presented. This work can help the novices of this field to understand the running behaviours of MTDs better and easier, and can also give developers design guidance of new MTD system by providing insights of the running patterns.**

Keyword—**Moving Target Defense, security, fundamental running patterns, confirmation**

Guilin Cai is a doctor student in the College of Computer at National University of Defense Technology in China. She received the B.S. and M.S. degrees in computer science from National University of Defense Technology in 2005 and 2010, respectively. Her main reserch interests include cyber security and proactive defense.

Baosheng Wang has been working as a professor and PhD supervisor in the College of Computer at National University of Defense Technology in China. He received the B.S., M.S. and Ph.D. degrees in computer science from National University of Defense Technology in 1992, 1995 and 2005, respectively. His research interests include router architecture, routing protocol and cyber security.
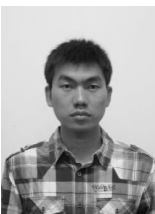
Yuebin Luo is a doctor student in the College of Computer at National University of Defense Technology in China. He received the B.S. degree in computer science from Tianjin University in 2010, and the M.S. degree in computer science from National University of Defense Technology in 2012. His research interests include intrusion detection, active defense, and network and information security.

Sudan Li has been working as an associate professor in the College of Computer at National University of Defence Technology in China. He received B.S., M.S and Ph.D. degrees in control theory and engineering from National University of Defence Technology in 1995,1998 and 2001 respectively. His research interests include network architecture and protocol, router software designe.

Xiaofeng Wang has been working as an assistant professor in th College of Computer at National University of Defense Technology in China. He received the B.S., M.S. and Ph.D. degrees in computer science from National University of Defense Technology in 2004, 2006 and 2009, respectively. His research interests include trustworthy networks and systems, applied cryptography, network security