The Impact of the Practical Security Test during the Software Development Lifecycle

Chen, Shiang-Jiun, Pan, Yu-Chun, Ma, Yi-Wei, Chiang, Cheng-Mou
Annette.Chen@ttc.org.tw, YC.Pan@ttc.org.tw, yiweimaa@gmail.com, James.Chiang@ttc.org.tw

Abstract—With the advent of the 5G era, due to the innovation of 5G architecture, open source is widely used under the software-defined everything architecture, software security is even more important. According to National Institute of Standards and Technology (NIST) Special Publication (SP) 800-64 Vol2 (Security Considerations in the System Development Life Cycle; SSDLC), the key security roles and responsibilities that are needed in development of most information systems. Sufficient information about the SDLC will improve the development on the secure software.

On this study, how to ensure software security from the initial requirement to the final release, and even the issues of operation and disposal will be explored. We deploy different test methods in different phases of SDLC, including Software Composition Analysis (SCA), Interactive Application Security Testing (IAST), Static Application Security Testing (SAST), and Dynamic Application Security Testing (DAST), etc. From the experiment, the initial security requirements are improved by detecting the problems, and then the security of the software is improved.

Keyword—Security by Design, trustworthiness, vulnerability, security development lifecycle, National Vulnerability Database, National Institute of Standards and Technology (NIST), SCA, IAST, SAST, DAST

Shiang-Jiun Chen is working in TTC (Telcom Technology Center) Taiwan and received her PhD degree in the The University of Texas at Arlington. Her research interests include numerical analysis, software defined networking, software testing.

Yu-Chuan Pan is working in TTC (Telcom Technology Center) Taiwan and received the PhD degree in the Department of Information Management of National Taiwan University. His research interests include AIoT, Cyber security, Internet service, 5G and cloud computing.

Yi-Wei Ma is an assistant professor in National Taiwan University of Science and Technology. He received the PhD degree in the Department of Engineering Science at National Cheng Kung University, Tainan, Taiwan. His research interests include internet of things, cloud computing, future network and ubiquitous computing.

Cheng-Mou Chiang received the M.S. degree in Electrical Engineering of National Taiwan University of Science and Technology, Taipei, Taiwan. His research interests include network function virtualization, and software-defined network.