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SVID: Structured Vulnerability Intelligence for Building Deliberated Vulnerable Environment

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Abstract : The diversity and complexity of modern IT systems make it almost impossible for internal teams to find vulnerabilities in all software before the software is officially released. The emergence of threat intelligence and vulnerability reporting policy has greatly reduced the burden on software vendors and organizations to find vulnerabilities. However, to prove the existence of the reported vulnerability, it is necessary but difficult for security incident response team to build a deliberated vulnerable environment from the vulnerability report with limited and incomplete information. This paper presents a structured, standardized, machine-oriented vulnerability intelligence format, that can be used to automate the orchestration of Deliberated Vulnerable Environment (DVE). This paper highlights the important role of software configuration and proof of vulnerable specifications in vulnerability intelligence, and proposes a triad model, which is called DIR (Dependency Configuration, Installation Configuration, Runtime Configuration), to define software configuration. Finally, this paper has also implemented a prototype system to demonstrate that the orchestration of DVE can be automated with the intelligence.

Keywords : DIR triad model, DVE, vulnerability intelligence, vulnerability recurrence
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