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Simulation Platform for Cyber-Security and Vulnerability Analysis of Critical Infrastructures

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Abstract

The progressive advances in information and communication technology have lend modern critical infrastructures to become more and more complex and interconnected, and in continuous evolution. The increasing complex interrelation among such critical systems creates new security vulnerabilities, which can be exploited by malicious users to compromise sensible data and other systems also very far from the impact zone. Identifying and analyzing these complex interactions represent a challenge to the evaluation of the real vulnerability of each critical system. On the other hand, the evaluation of this complex and large-scale systems requires expensive and sophisticated modeling practices, simulation tools, and experimentation infrastructure. Therefore, we present a hybrid and distributed simulation platform for cyber-security analysis of large-scale critical infrastructure systems. It enables testers to assemble complex and distributed experimental scenarios in the cloud, by integrating different simulated environments, on which perform sophisticated vulnerability analysis, by exploiting penetration testing and monitoring facilities.

Keywords: Critical infrastructures, cyber-security, simulation, HLA, penetration testing, cloud computing.

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