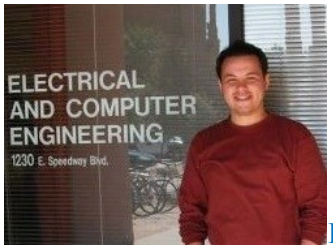
Abstract: Cloud Computing is the new emerged paradigm for the IT industry that provides ubiquitous, on-demand, transparent services. However, there are many concerns for the cloud computing paradigm starting from its management upto the security since the services are no longer stored in local systems. Among the concerns, resilient computation is a big issue, especially for the critically important computation requirements. DDoS attacks reaching 400Gbps, breaches using the vulnerabilities in the Operating Systems and the softwares used, etc. show the need for a resilient computation paradigm for mission critical infrastructures. It is well known that secure cloud computing systems is an extremely complex problem due to the many interdependent tasks such as application layer firewalls, alert monitoring and analysis, source code analysis, and user identity management (especially when the worldwide IP traffic is considered). Therefore, it is strongly assumed that we cannot build cloud services that are immune to all type of attacks, vulnerabilities, faults, etc. Therefore, resilient services approach is becoming an alternative solution to address cyberattacks and mitigate their impacts. In our work, we present a methodology for Autonomic Resilient Cloud Management (ARCM) based on Moving Target Defense (MTD), Software Behavior Obfuscation (SBO), and Autonomic Computing (AC). By continuously and randomly changing the cloud execution environments (software, platforms, hosts, etc.) in an autonomous manner, we harden our execution environment against for the attackers and their observation to figure out the current execution environment and their existing vulnerabilities, thus allowing the system to evade attacks. We show how to apply the ARCM to one class of applications, MapReduce, and evaluate its performance and overhead.



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