

Seminar Talk

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Title:

Autonomic Resilient Cloud

Abstract:

Cloud Computing is emerging as a new paradigm that aims delivering computing as a utility. For the cloud computing paradigm to be fully adopted and effectively used, it is critical that the security mechanisms are robust and resilient to faults and attacks. Securing cloud systems is extremely complex due to the many interdependent tasks such as application layer firewalls, alert monitoring and analysis, source code analysis, and user identity management. It is strongly believed that we cannot build cloud services that are immune to attacks. Resiliency to attacks is becoming an important approach to address cyberattacks and mitigate their impacts. Resiliency for mission critical systems is demanded higher. In this seminar, I will introduce a recent work that was presented in The International Conference on Cloud and Autonomic Computing (CAC 2014). In this work, we unveil a methodology to develop an Autonomic Resilient Cloud Management (ARCM) based on moving target defense, cloud service Behavior Obfuscation (BO), and autonomic computing. By continuously and randomly changing the cloud execution environments and platform types, it will be difficult especially for insider attackers to figure out the current execution environment and their existing vulnerabilities, thus allowing the system to evade attacks. We also showed how to apply the ARCM to one class of applications, Map/Reduce, and evaluate its performance and overhead.

Bio sketch:

Dr. Youssif Al-Nashif is an Assistant Professor of Electrical and Computer Engineering in ODU, he received his Ph.D. in Computer Engineering from The University of Arizona in 2008. He received his B.Sc. Electrical Engineering and M.Sc. Communication and Electronics Engineering from Jordan University of Science and Technology in 1999 and 2000 respectively. He was an Assistant Research Professor in the Department of Electrical and Computer Engineering at The University of Arizona from spring 2009 to Summer 2014. He Joined ODU in July 2014. Dr. Al-Nashif conducts research in

Cybersecurity, Cyber Resilience, Secure Critical Infrastructures, Cyber Trust, Cloud Security, Autonomic Computing, and Data Analysis. He designed and implemented the Multi-Level Intrusion Detection System and the Autonomic Network Defense System which were the core technology transferred to AVIRTEK, Inc. He was the lead Researcher at AVIRTEK, Inc. from 2009 to 2014. Dr. Al-Nashif also conducts research in workload behavior modeling and autonomic power and performance management.