

Resilient Asymmetric Security (RAS)  
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#### Abstract

Current advances in computing, networking, software and services will lead to the development of cyberspace services (e.g., cloud services) that are ubiquitous and touch all aspects of our life. These pervasive services will revolutionize the way we do business, maintain our health, conduct education, and how secure, protect, and entertain ourselves. However, along with these advances, we are experiencing grand challenges to ensure that our cyberspace resources and services are highly resilience; that means it can effectively tolerate epidemic-style cyberattacks such as viruses and worms, spams, and denial-of-service attacks; deliver software systems and services that can survive hardware/software failures and attacks; and manage its cyberspace resources and applications by being self-aware, self-adaptive, self-heal, or in general self-\*, i.e., autonomic operations. To address these challenges, we are developing a Resilient Asymmetric Security (RAS) approach. The goals of the RAS are: 1) Stop/eliminate the effectiveness of spams, viruses, worms and cyber attacks (known or unknown); 2) Deliver uninterrupted software and cloud services in spite of attacks and failures; and 3) Build "hassle-free" cyber services that are self-aware, self-adapt, self-heal, and self-protect.

In this presentation, I will discuss our approach to implement RAS that is based on three techniques: Software Behavior Encryption (SBE), Self Management (SM), and Collective Intelligence. I will also present experimental results and evaluation of our RAS approach to secure and protect applications as well as communications protocols.

#### Bio

Salim Hariri is a Professor in the Department of Electrical and Computer Engineering at The University of Arizona. He received his Ph.D. in computer engineering from University of Southern California in 1986, and an MSc from The Ohio State University in 1982. He is the UA site director of NSF Center for Autonomic Computing and he is the Editor-In-Chief for the CLUSTER COMPUTING JOURNAL (Springer, <http://clus.edmgr.com>).