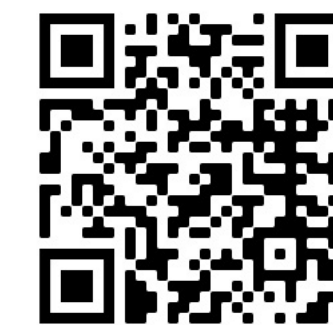


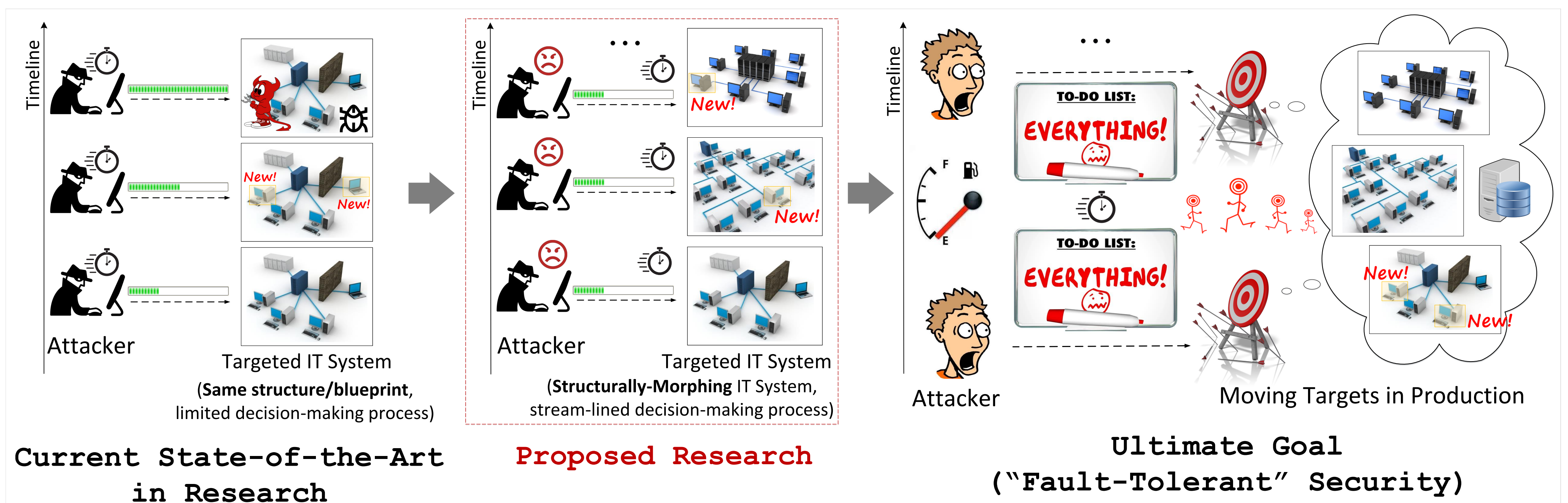
Creating and Managing Structurally-Morphing IT Systems – Moving Targets



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Moving Target Defense (MTD) techniques have been proposed as a way to rebalance the security landscape by increasing uncertainty and apparent complexity for adversaries, reducing their window of opportunity, and raising the costs of their reconnaissance and attack efforts. Intuitively, the idea of applying MTD techniques to an entire IT system should provide enhanced security; however, research in this area is still in its initial stages.

The **overarching goal** of this research is to develop a novel, comprehensive framework for creating and managing structurally-changing (morphing) IT systems in real-world scenarios.



Building Blocks:

- service meshes (e.g., Consul, Istio)
- virtualized infrastructures (e.g., AWS and VMware vSphere Enterprise),
- containerization techniques such as Docker, and
- configuration management tools (e.g., Ansible, Puppet).

Impact on Society

Structurally-morphing IT systems will force a change in the current modus operandi of cyber-attackers:

Impose a change from the “compromise and persist” paradigm to the more challenging obligation of repeatedly attempting to compromise a constantly-changing IT system.

Outreach and Education

Working with a diverse student group, the Jayhackers, and coaching them in cyber-defense or capture-the-flag competitions.

Goal: Deploying the proposed automated framework along competing student teams as part of cyber defense competitions (for example, as part of the CANSec regional competition and workshop)