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SRN: On Establishing Secure and Resilient Networking Services

"All War is based on Deception"

- Sun Tzu, Art of War

Sponsored by



Anthem.
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Security is a Reactive Problem

IRS 2015
724,000 users
affected.

Anthem
2015
Loss: \$100M

Equifax 2017
145.5M
Customers

PROBLEM



SINGLE TARGET




Unintelligent Security?

- Not easy to make changes **automatically** and **quickly** to adjust security defense system based on current security situations

- little programmability,
- defense goals are predefined,
- human-in-the loop,
- lack of learning, planning, and execution capabilities.





*“Art of War is based on
Deception”*

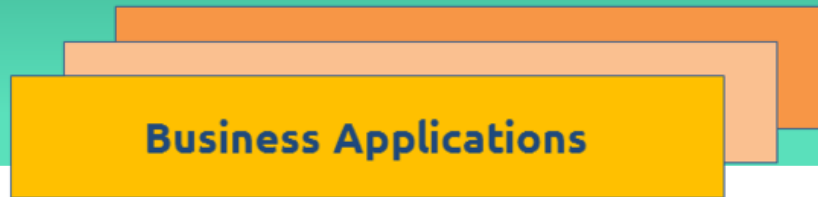
- Sun Tzu, Art of War

MOVING TARGET DEFENSE

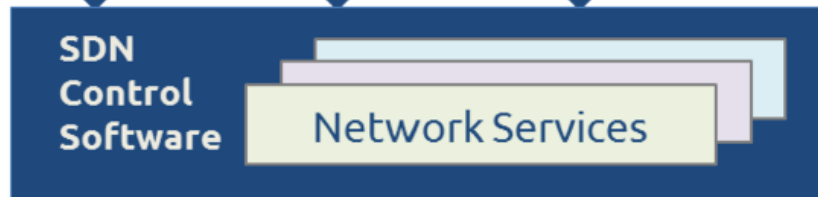


Software Defined Networking and Security

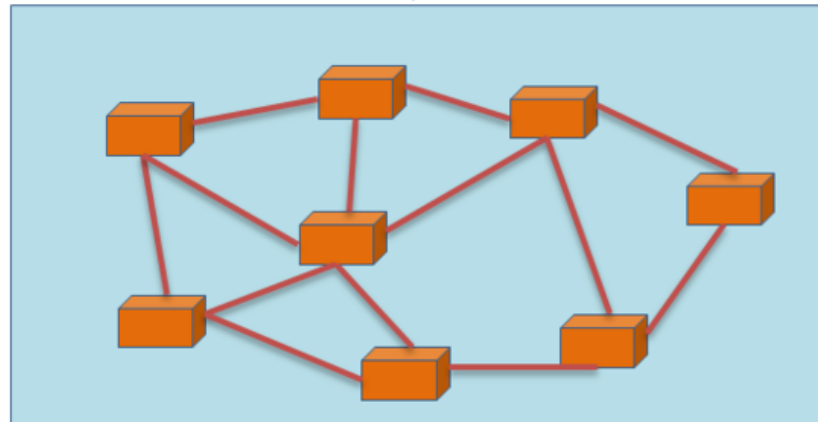
APPLICATION LAYER



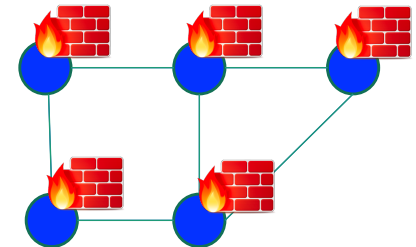
CONTROL LAYER



INFRASTRUCTURE LAYER



Programmable Security

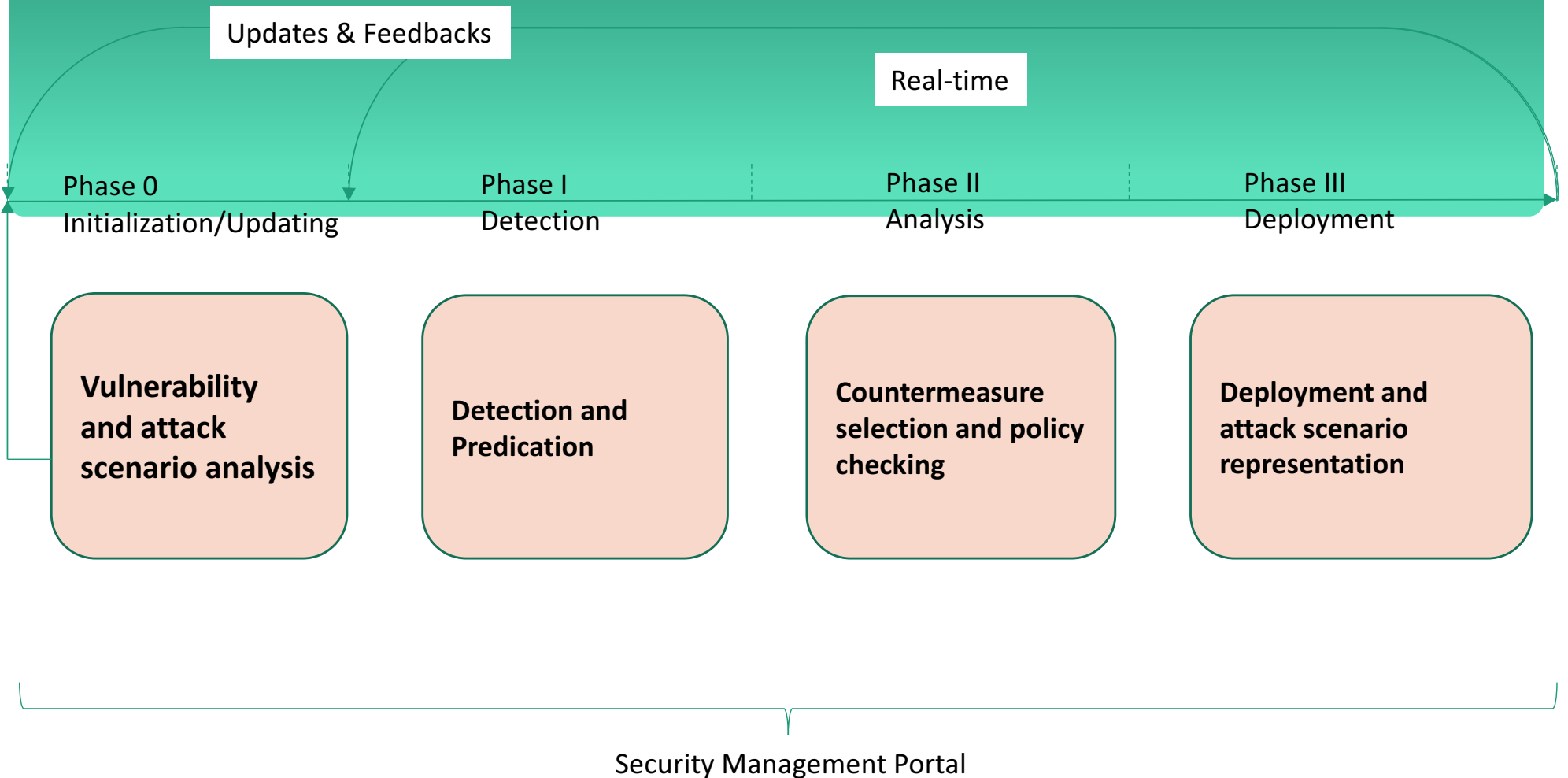


Programmable Networks

What is intelligent and software-defined security?

- **Reactive → Proactive**
Act before attackers and reduce the bad consequence.
- **Static → Dynamic:**
Use virtualization and programmable approaches to automate security defense approaches
- **Intelligently shift and change over time**
Smartly (re)configure the security system to **increase the complexity to attackers, reduce the attack surfaces** with **minimal level of intrusiveness** to good users.

Overview: A Network ISDS Architecture (Four Phases)



COST AND RISK REDUCTION

70% to 4%

man-power
reduction for
security analysis.

96%

Reduction in
security attacks

Based on our testing results from Science DMZ platform

Proven Technology

- Ongoing Pilot project talk with NCI inc. and State Farm.
- ASU Science DMZ Internet2.

JOURNEY..

- Over \$1M research, equipment, and development grant from ONR and NSF to develop the intelligent SDN security technology from 2013 to 2018.
- 5 provisional Patents, 1 issue US Patent.
- \$667K NSF SaTC (with TTP) award
- \$22,500 award at ASU New Venture Challenge.

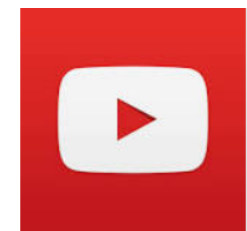


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[Demo Video](#)