NITTF Tech Talk – Trends in Insider Risk Quantification, Part 3

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From Our Last Tech Talk



Test your technical controls in a test environment, and not in production

To do this, you'll need:

- Virtual Environments, e.g., <u>https://github.com/cmu-sei/crucible</u>
- User Simulation, e.g., https://github.com/cmu-sei/GHOSTS

← Today's Focus

Use Cases to Consider

Operational

• Example: measure alert volume, validate alert accuracy

Coverage

• Example: measure percentage of indicators covered by monitoring system(s)

Latency

• Example: measure average time between activity and alert, alert throughput

Compliance

• Example: validate percentage of recommended / required (NIST SP 800-53, NITTF Minimum Standards) controls implemented

Testing and Validation

Candidate Controls

- Faulty indicators
- Faulty monitoring tools
- Legacy Systems

Tune existing policies

• Overly active alerts

Data Sources

• Exploratory Analysis

Security Testing

- Assume the identity of an insider
- Training opportunities

•Software Tools

- Commercial
- Open-Source

New Deployment Environments

- Yellow/Red/Green Networks
- Federated SIEM

Functional Requirements for Simulation

 Technical observables: 	Enterprise and personal email
	Multi-browser web usage
	File operations (create/read/update/delete)
	Using Cloud storage s oftware
	Remova ble Media
	Virtual Private Networks
-	Printers/Scanners
_	Remote Administration
•Behavioral	Organizational structure
observables:	Privileged and Non-Privileged users
	Personnel Events (performance reviews, complaints, reprimands, travel)

Realistic work schedule

https://insights.sei.cmu.edu/blog/functional-requirements-for-insider-threat-tool-testing

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Reference Approach

Configurable

• Adjust security controls, vendors, user behavior

Decoupled

• Data generation should not rely on specific tools or outputs

Controlled/Repeatable

• Follow a sound scientific method

Accessible

• Stakeholders, vendors, or third-parties

Comprehensive

• Technical and behavioral actions and indicators

Reference Architecture

- Virtualized (VM) on-prem environment
 - 2x: 256GB, Dual 8 Core Xenon
 - 2TB storage
 - Linked VM Clones
- Amazon Web Services Proof of Concept
 - GovCloud ITAR Compliance
 - 10 Service Systems (t3.nano xlarge)
 - 5-10 Users (t3.small)
 - 4-8 hours/day
 - <\$500/month



Open-Source/Freeware Infrastructure Tools

- Greybox/TopGen (Topology Generator) <u>https://github.com/cmu-</u> <u>sei/topgen /</u> <u>https://github.com/cmu-</u> <u>sei/greybox</u>
 - Isolated (Air-Gapped) Internet-in-a-box
- iRedMail <u>https://www.iredmail.org/</u>
 - Webmail simulation
- Owncloud Server
 <u>https://owncloud.com/</u>
 - Cloud storage simulation



Open-Source User Simulation Tools

- GHOSTS ((G)eneral HOSTS) Framework https://github.com/cmu-sei/GHOSTS
 - Non-player character (NPC) automation
 - Baseline traffic
- GHOSTS-Animator https://github.com/cmu-sei/GHOSTS-ANIMATOR
 - User detail generator
 - Addresses, Rank, Work Location, Potential Risk Indicators

https://insights.sei.cmu.edu/blog/generating-realistic-non-player-characters-for-trainingcyberteams/

Infrastructure as Code (IaC)

```
module "dc" [
source = "./modules/dc"
dc_instance_type = var.dc_instance_type
subnets = var.subnets
security_groups = var.security_groups
}
```

resource "aws_instance"	"this" {
ami	<pre>= data.aws_ami.this.id</pre>
instance_type	<pre>= var.dc_instance_type</pre>
<pre>iam_instance_profile</pre>	= "FIN SSM Role"
private_ip	= "10.0.40.20"
subnet_id	= var.subnets
<pre>vpc_security_group_ids</pre>	<pre>= var.security_groups</pre>
tags = {	
Terraform = "true"	
Name = "FIN-D	с"
Environment = "FIN T	est"
}	
}	

Open-Source Tools:

- Terraform <u>https://www.terraform.io/</u>
 - Infrastructure as Code
 - Multi-platform (Windows/Linux/OSX)
 - Multi-cloud (AWS/VMware/Azure)
- Packer https://www.packer.io/
 - Virtual machine image builder
- Ansible <u>https://www.ansible.com/</u>
 - System provisioning and configuration

What Next?

- Faster and more realistic baseline data generation
 - How 'real' is 'real enough' for certain test objectives?
- Variety and modularity of testing environment
- Automated test and evaluation

Q&A / Open Discussion



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