NITTF Tech Talk – Trends in Insider Risk Quantification, Part 2

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Document Markings

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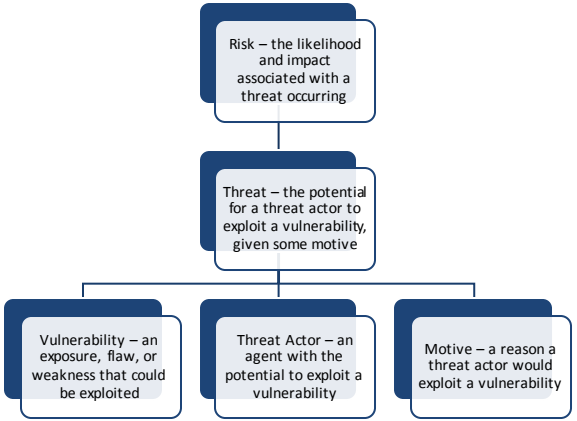
From Our Last Tech Talk



- From “Mitigating Insider Threats” to “Managing Insider Risk”
- Quantifying risk involves being able to quantify the impact and likelihood associated with a threat occurring

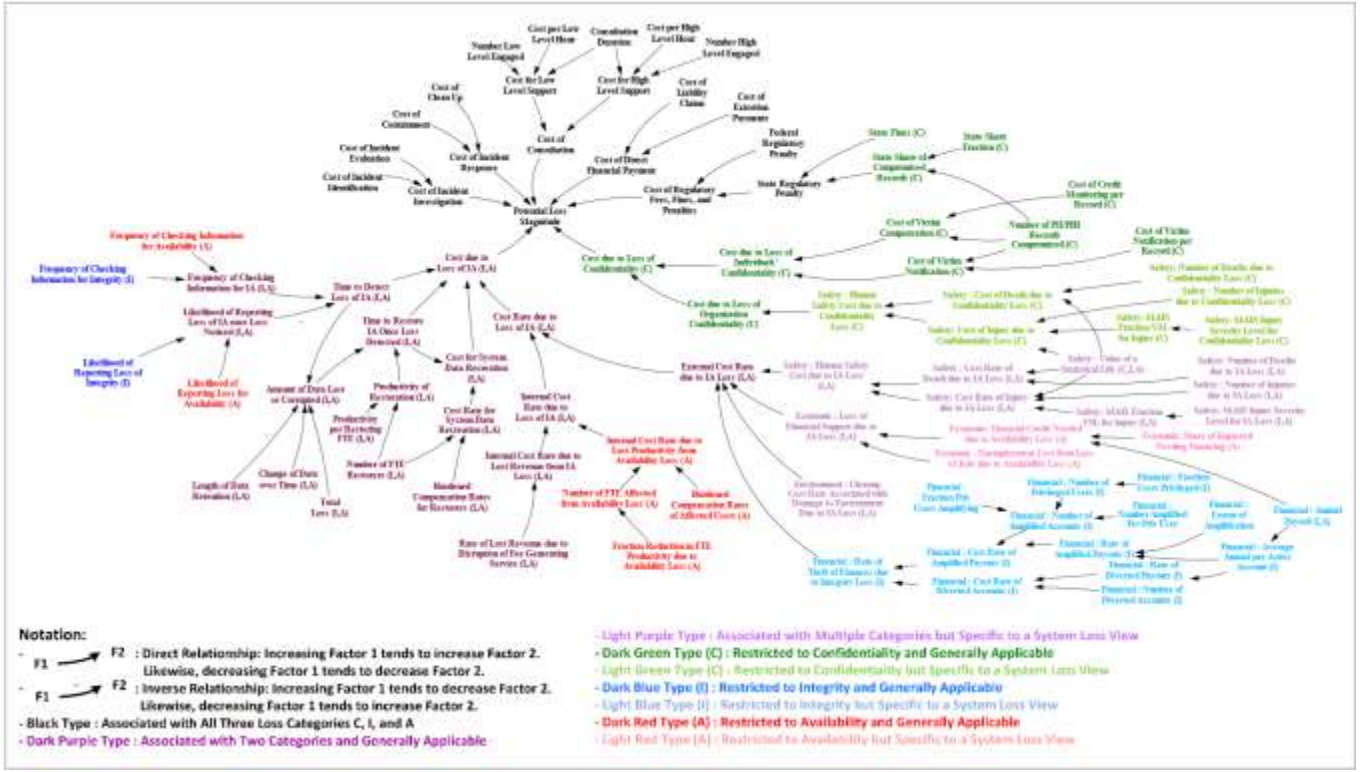
Quantifying Threat Likelihood

What can you use to measure the probability that a specific threat scenario occurs based on a series of conditions?

- Assessments / Red-team / Purple-team / Table-top exercises
- Threat models
- Simulations
- Incident and operational data

← Today's Focus

Loss Magnitude Estimation in Support of Business Impact Analysis



https://resources.sei.cmu.edu/library/asset-view.cfm?assetid=650828

Threat Modeling

Threat Modeling Method	Features
STRIDE	+ Helps identify relevant mitigating techniques + Is the most mature + Is easy to use but is time consuming
PASTA	+ Helps identify relevant mitigating techniques + Directly contributes to risk management + Encourages collaboration among stakeholders + Contains built-in prioritization of threat mitigation + Is laborious but has rich documentation
LINDDUN	+ Helps identify relevant mitigation techniques + Contains built-in prioritization of threat mitigation + Can be labor intensive and time consuming
CVSS	+ Contains built-in prioritization of threat mitigation + Has consistent results when repeated + Has automated components + Has score calculations that are not transparent
Attack Trees	+ Helps identify relevant mitigation techniques + Has consistent results when repeated + Is easy to use if you already have a thorough understanding of the system
Persona non Grata	+ Helps identify relevant mitigation techniques + Directly contributes to risk management + Has consistent results when repeated + Tends to detect only some subsets of threats
Security Cards	+ Encourages collaboration among stakeholders + Targets out-of-the-ordinary threats + Leads to many false positives
hTMM	+ Contains built-in prioritization of threat mitigation + Encourages collaboration among stakeholders + Has consistent results when repeated
Quantitative TMM	+ Contains built-in prioritization of threat mitigation + Has automated components + Has consistent results when repeated
Trike	+ Helps identify relevant mitigation techniques + Directly contributes to risk management + Contains built-in prioritization of threat mitigation + Encourages collaboration among stakeholders + Has automated components + Has vague, insufficient documentation
VAST Modeling	+ Helps identify relevant mitigation techniques + Directly contributes to risk management + Contains built-in prioritization of threat mitigation + Encourages collaboration among stakeholders + Has consistent results when repeated + Has automated components + Is explicitly designed to be scalable + Has little publicly available documentation
OCTAVE	+ Helps identify relevant mitigation techniques + Directly contributes to risk management + Contains built-in prioritization of threat mitigation + Encourages collaboration among stakeholders + Has consistent results when repeated + Is explicitly designed to be scalable + Is time consuming and has vague documentation

https://insights.sei.cmu.edu/sei_blog/2018/12/threat-modeling-12-available-methods.html

Simulation

Analyze the effects of potential insider activity in the broader organizational context

To do this, you can use techniques such as:

- Agent-based modeling
- System dynamics modeling
- Bayesian belief networks

https://insights.sei.cmu.edu/sei_blog/2016/09/modeling-and-simulation-in-insider-threat.html

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

To do this, you'll need:

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

Data – From Where and For What?

- Baseline data – 'assumed good'
- Incident data – both yours and others
  - Collect your own, here's a schema: https://insights.sei.cmu.edu/insider-threat/2011/08/the-cert-insider-threat-database.html
- Base rates of occurrence – how often do certain conditions occur in non-incidents?
  - See *Normalizing Normal: Analyzing Potential Risk Indicators of Insider Threat in the U.S. Department of Defense and Intelligence Communities* (May 2019) – Available from max.gov via the PAC PMO SSC Research Index
- Synthetic data – simulated threat activity inserted into a baseline of assumed-good activity
  - See the CERT Insider Threat Test Data Set: https://resources.sei.cmu.edu/library/asset-view.cfm?assetid=508099

The Insider Threat Community's Data Challenges

Not Enough

Too Much

Square Pegs, Round Holes

Apples to Oranges

Where to Next?

- Better models, more context
- Better information sharing, and information sharing tools
  - Focus on *metadata*
- More telemetry around the analysis process
- Research → Operations → Research

Q&A / Open Discussion

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