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SEI TECHNOLOGIES FORUM

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The Insider Threat: Lessons Learned from Actual Insider Attacks

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Trzeciak is currently a senior member of the technical staff at CERT. He is the technical team lead of the Insider Threat Research team; a team focusing on insider threat research; threat analysis and modeling; assessments; and training. Trzeciak has more than 20 years experience in software engineering; database design, development, and maintenance; project management; and information security.

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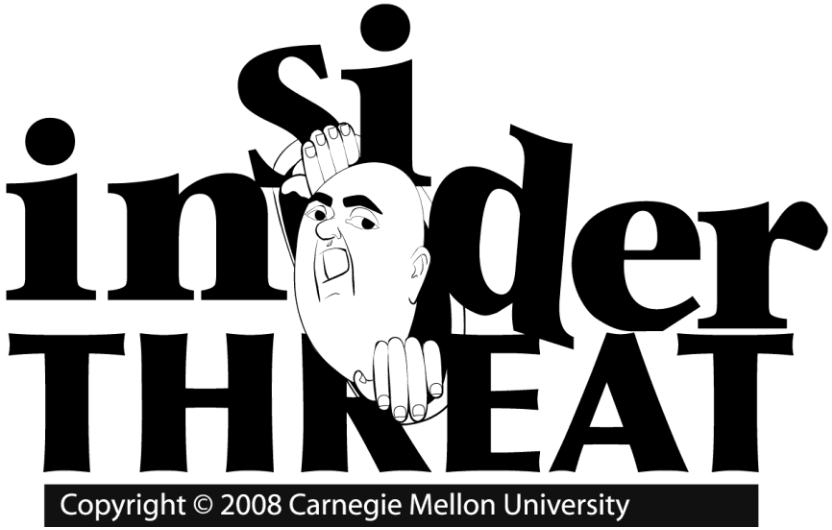
Agenda

Introduction to the CERT Insider Threat Center

CERT's Insider Threat Crime Profiles

Mitigation Strategies

Discussion



Who is a Malicious Insider?

Current or former employee, contractor, or other business partner who

- ***has or had authorized access to an organization's network, system or data and***
- ***intentionally exceeded or misused that access in a manner that***
- ***negatively affected the confidentiality, integrity, or availability of the organization's information or information systems.***

Types of Insider Crimes

Insider IT sabotage

An insider's use of IT to direct specific harm at an organization or an individual.

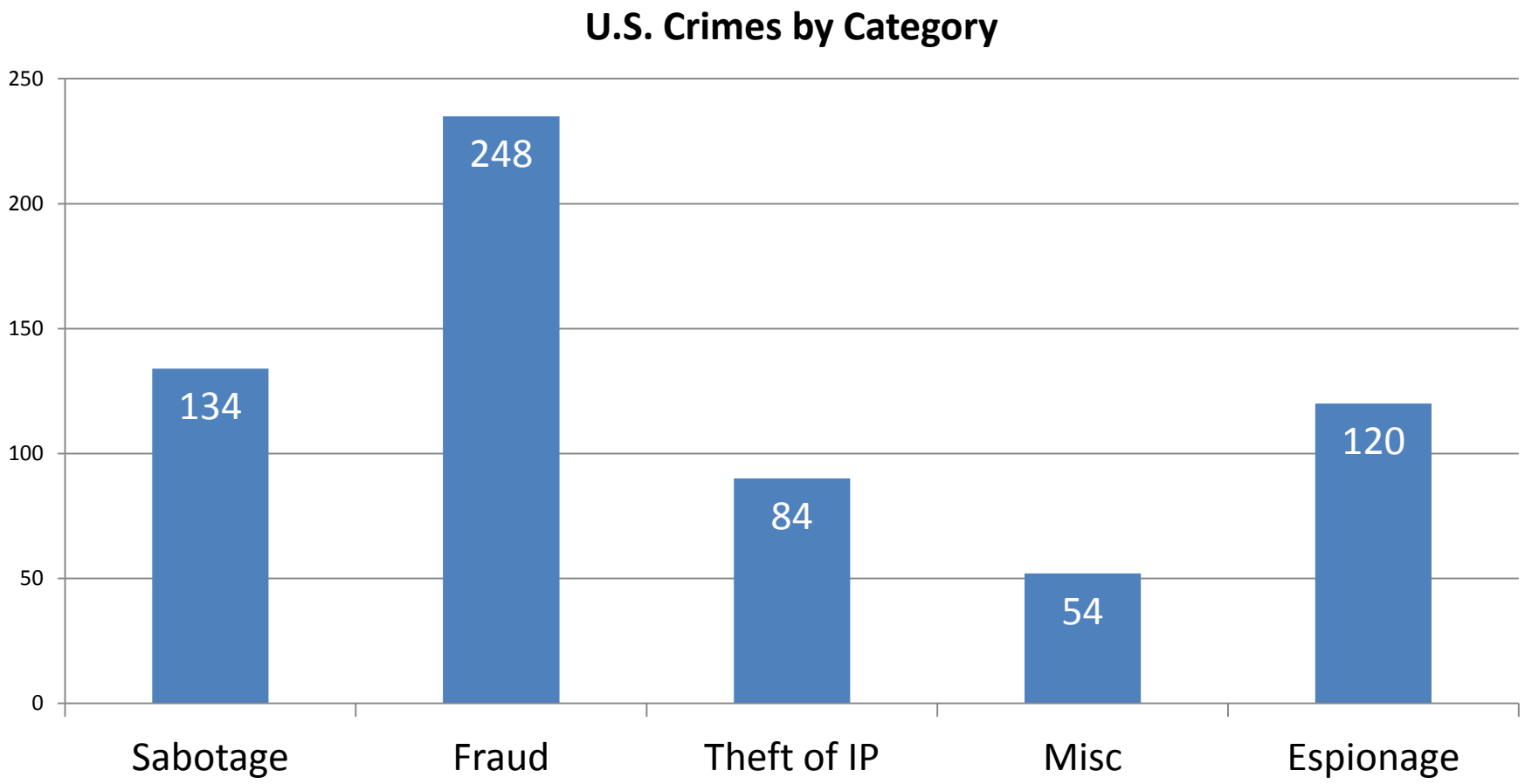
Insider theft of intellectual property (IP)

An insider's use of IT to steal intellectual property from the organization. This category includes industrial espionage involving insiders.

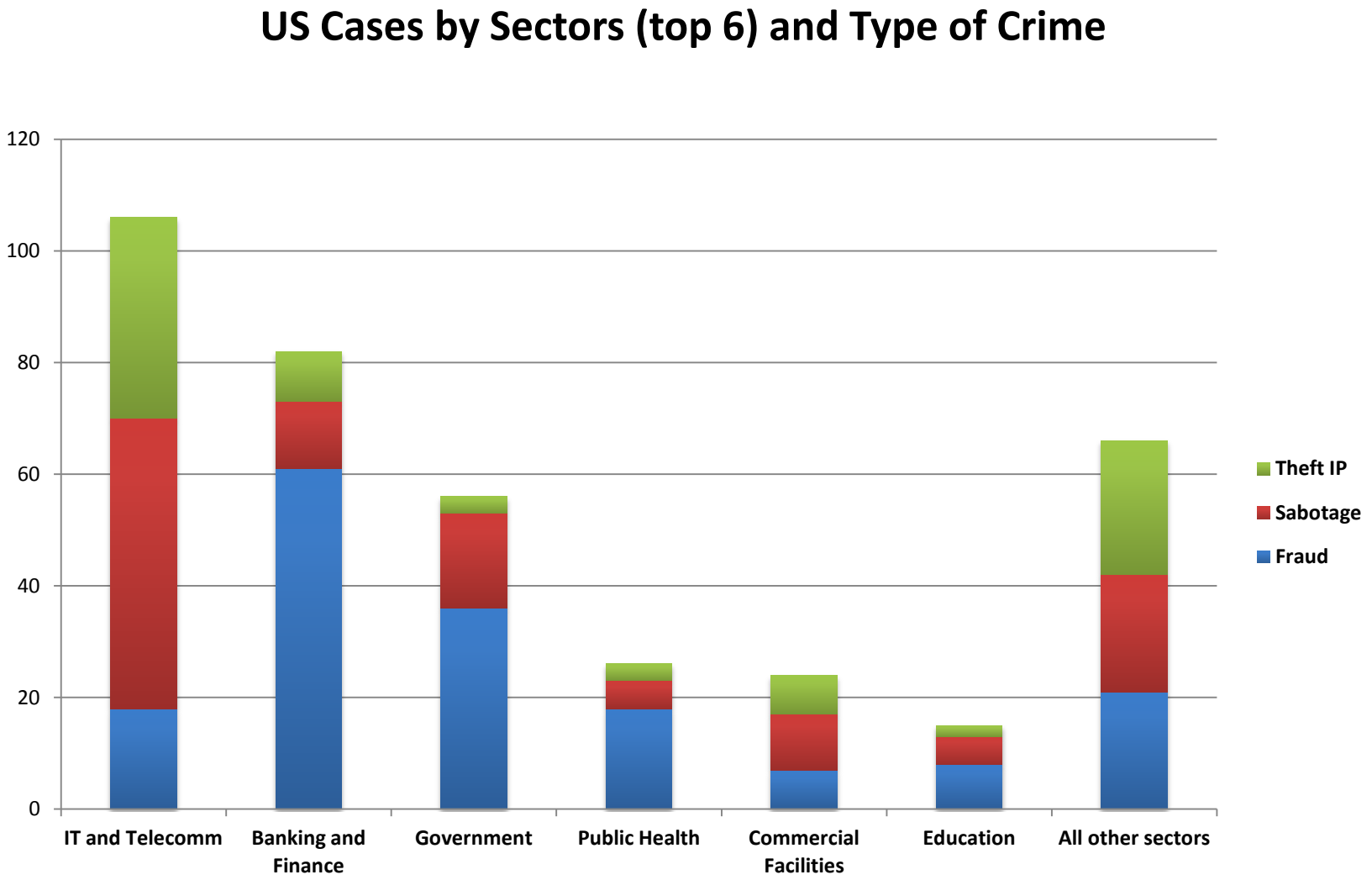
Insider fraud

An insider's use of IT for the unauthorized modification, addition, or deletion of an organization's data (not programs or systems) for personal gain, or theft of information which leads to fraud (identity theft, credit card fraud).

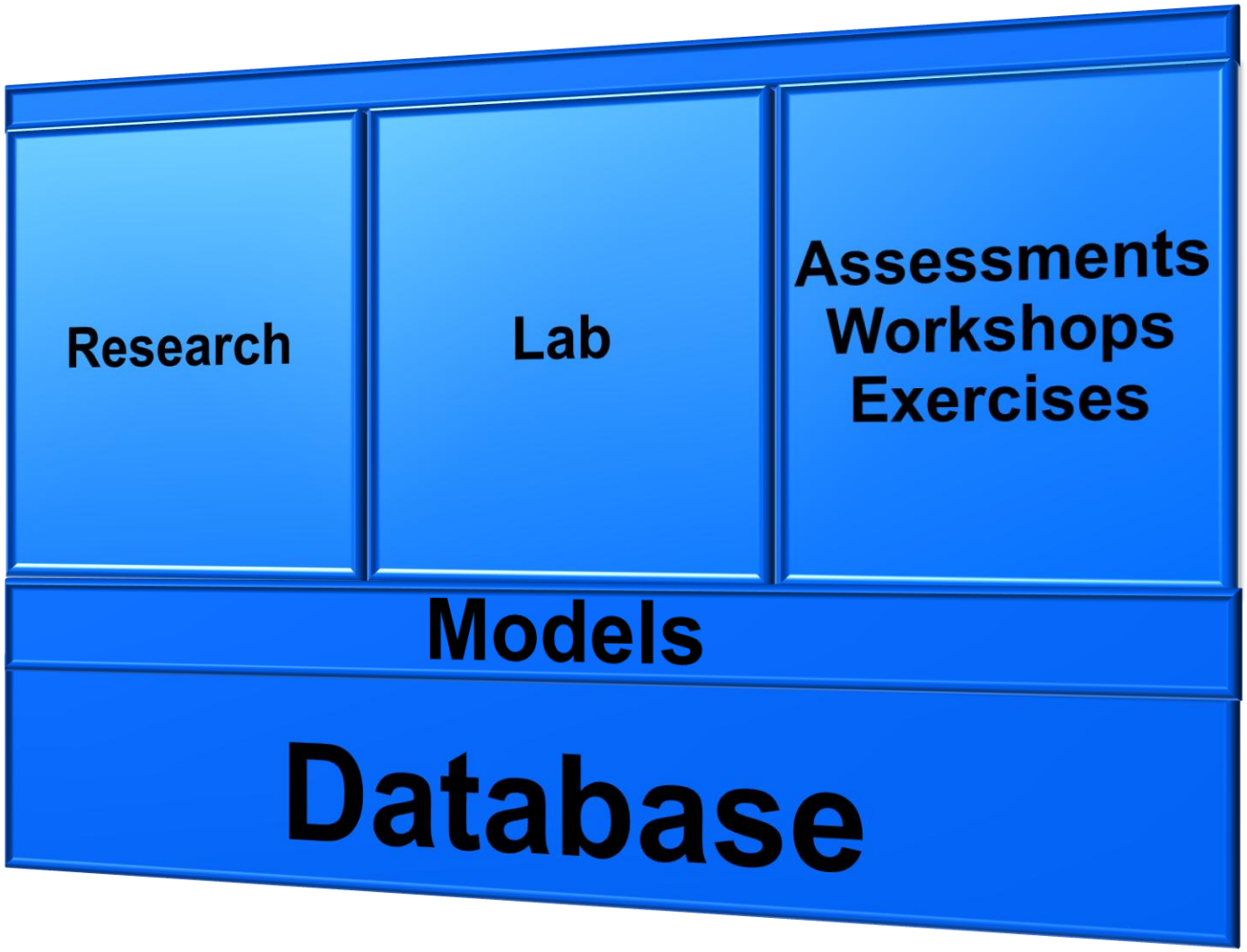
CERT's Insider Threat Case Database



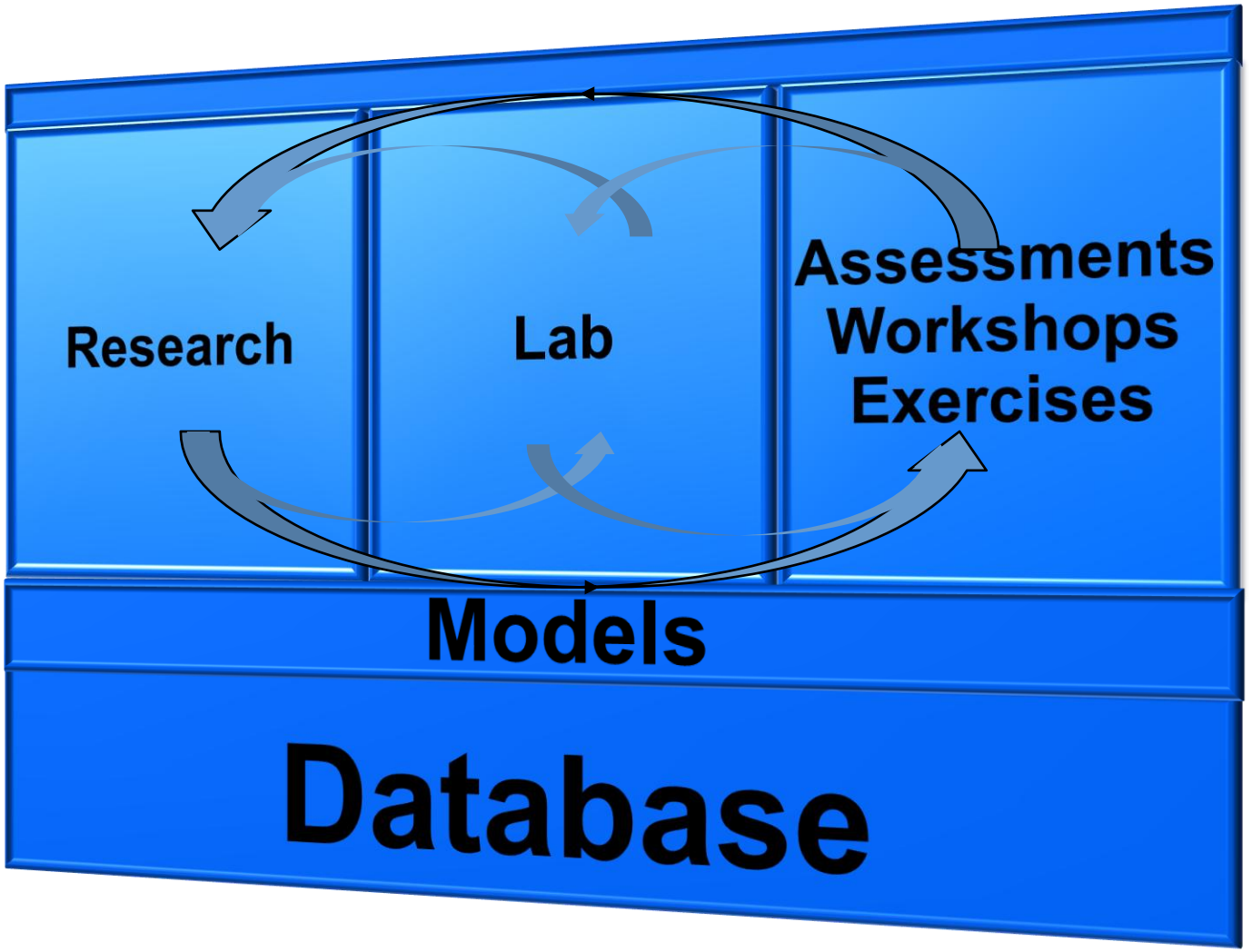
Critical Infrastructure Sectors



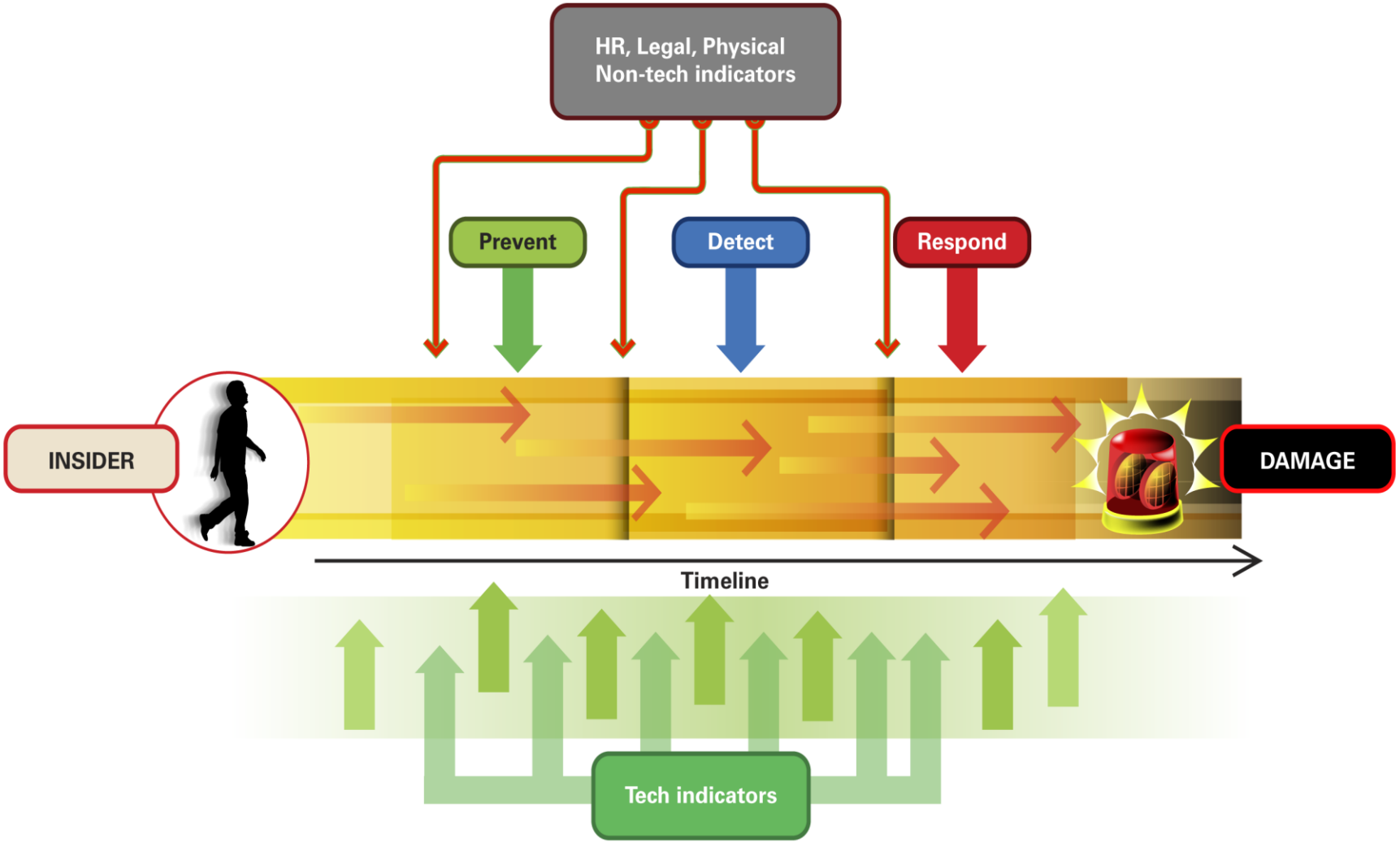
CERT's Unique Approach to the Problem



CERT's Unique Approach to the Problem



CERT Insider Threat Center Objective



Opportunities for prevention, detection, and response for an insider attack

Insider Crime Profiles

IT Sabotage

TRUE STORY:

SCADA systems for an oil-exploration company is temporarily disabled…

A contractor, who's request for permanent employment was rejected, planted malicious code following termination

Insider IT Sabotage

Who did it?

- Former employees
- Male
- Highly technical positions
- Age: 17 – 60

How did they attack?

- No authorized access
- Backdoor accounts, shared accounts, other employees' accounts, insider's own account
- Many technically sophisticated
- Remote access outside normal working hours

Summary of Findings

	IT Sabotage
% of crimes in case database**	35%
Current or former employee?	Former
Type of position	Technical (e.g. sys admins or DBAs)
Gender	Male

***** Does not include national security espionage***

Summary of Findings

	IT Sabotage
Target	Network, systems, or data
Access used	Unauthorized
When	Outside normal working hours
Where	Remote access
Recruited by outsiders	None
Collusion	None

Fraud

TRUE STORY:

An undercover agent who claims to be on the "No Fly list" buys a fake drivers license from a ring of DMV employees...

The 7 person identity theft ring consisted of 7 employees who sold more than 200 fake licenses for more than $1 Million.

Fraud: Theft or Modification

Who did it?

- Current employees
- “Low level” positions
- Gender: fairly equal split
- Average age: 33

What was stolen/modified?

- Personally Identifiable Information (PII)
- Customer Information (CI)
- Very few cases involved trade secrets

How did they steal/modify it?

- During normal working hours
- Using authorized access

Summary of Findings

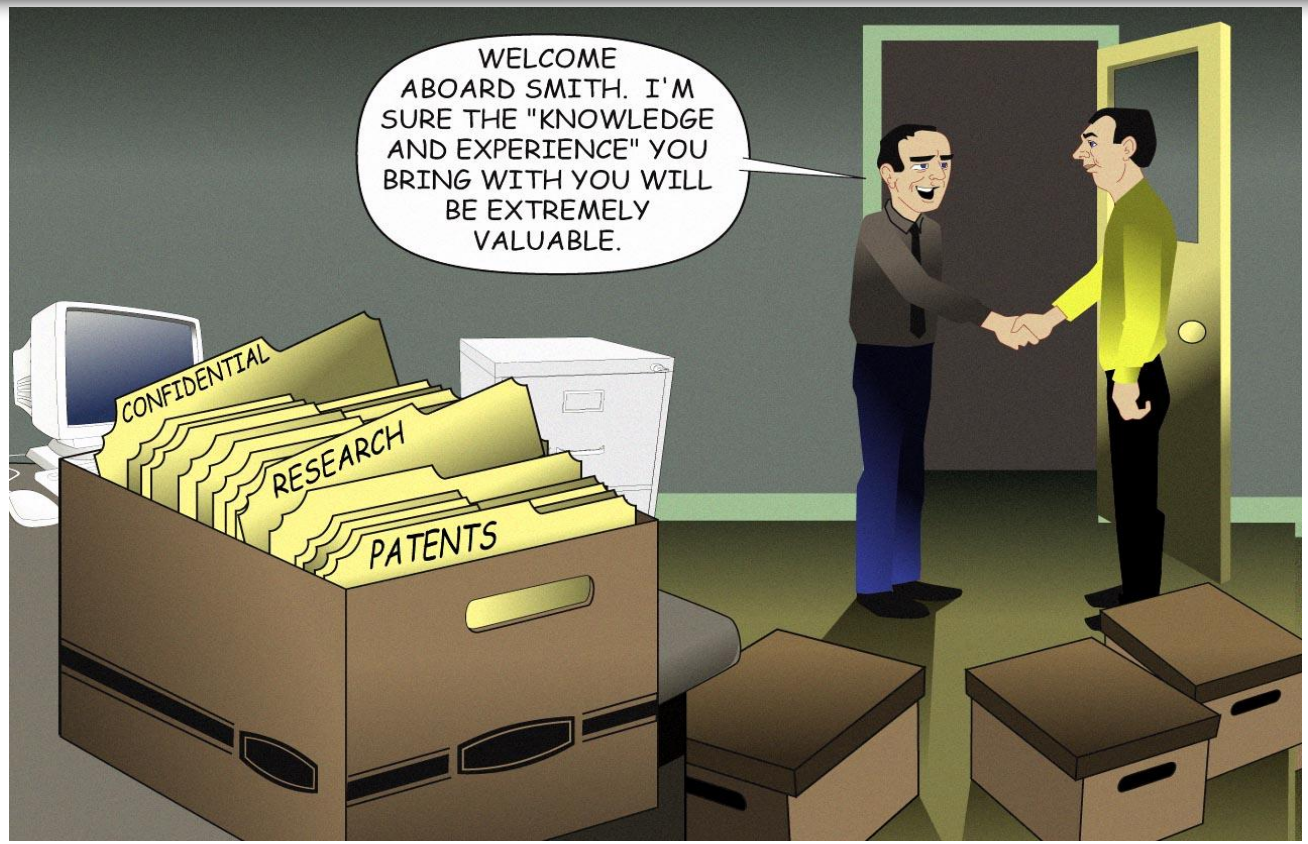
	IT Sabotage	Fraud
% of crimes in case database**	35%	40%
Current or former employee?	Former	Current
Type of position	Technical (e.g. sys admins or DBAs)	Non-technical, low-level positions with access to confidential or sensitive information (e.g. data entry, customer service)
Gender	Male	Fairly equally split between male and female

**** Does not include national security espionage***

Summary of Findings

	IT Sabotage	Fraud
Target	Network, systems, or data	PII or Customer Information
Access used	Unauthorized	Authorized
When	Outside normal working hours	During normal working hours
Where	Remote access	At work
Recruited by outsiders	None	½ recruited for theft; less than 1/3 recruited for mod
Collusion	None	Mod: almost ½ colluded with another insider Theft: 2/3 colluded with outsiders

Theft of Intellectual Property



TRUE STORY:

Research scientist downloads 38,000 documents containing his company's trade secrets before going to work for a competitor…

Information was valued at $400 Million

Theft of Intellectual Property

Who did it?

- Current employees
- Technical or sales positions
- All male
- Average age: 37

What was stolen?

- Intellectual Property (IP)
- Customer Information (CI)

How did they steal it?

- During normal working hours
- Using authorized access

Dynamics of the Crime

Most were *quick* theft upon resignation

Stole information to

- Take to a new job
- Start a new business
- Give to a foreign company or government organization

Collusion

- Collusion with at least one *insider* in almost 1/2 of cases
- Outsider *recruited* insider in less than 1/4 of cases
- Acted *alone* in 1/2 of cases

Summary of Findings

	IT Sabotage	Fraud	Theft of Intellectual Property
% of crimes in case database**	35%	40%	18%
Current or former employee?	Former	Current	Current
Type of position	Technical (e.g. sys admins or DBAs)	Non-technical, low-level positions with access to confidential or sensitive information (e.g. data entry, customer service)	Technical (71%) - scientists, programmers, engineers Sales (29%)
Gender	Male	Fairly equally split between male and female	Male

***** Does not include national security espionage***

Summary of Findings

	IT Sabotage	Fraud	Theft of Intellectual Property
Target	Network, systems, or data	PII or Customer Information	IP (trade secrets) – 71% Customer Info – 33%
Access used	Unauthorized	Authorized	Authorized
When	Outside normal working hours	During normal working hours	During normal working hours
Where	Remote access	At work	At work
Recruited by outsiders	None	½ recruited for theft; less than 1/3 recruited for mod	Less than 1/4
Collusion	None	Mod: almost ½ colluded with another insider Theft: 2/3 colluded with outsiders	Almost ½ colluded with at least one insider; ½ acted alone

Mitigation Strategies

Our Suggestion

Continuous Logging

Targeted Monitoring

Real-time Alerting

Common Sense Guide to Prevention and Detection of Insider Threats

http://www.cert.org/archive/pdf/CSG-V3.pdf

Summary of Best Practices in CSG

Consider threats from insiders and business partners in enterprise-wide risk assessments.	Consider insider threats in the software development life cycle.
Clearly document and consistently enforce policies and controls.	Use extra caution with system administrators and technical or privileged users.
Institute periodic security awareness training for all employees.	Implement system change controls.
Monitor and respond to suspicious or disruptive behavior, beginning with the hiring process.	Log, monitor, and audit employee online actions.
Anticipate and manage negative workplace issues.	Use layered defense against remote attacks.
Track and secure the physical environment.	Deactivate computer access following termination.
Implement strict password and account management policies and practices.	Implement secure backup and recovery processes.
Enforce separation of duties and least privilege.	Develop an insider incident response plan.

Point of Contact

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