CERT

Preventing Insider Sabotage: Lessons Learned From Actual Attacks

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Agenda

What is CERT?

Are Insiders a Threat?

CERT/U.S. Secret Service (USSS) Insider Threat Study

Best practices

- Supporting Findings
- Case Examples

What's Next

Questions/Discussion

What is CERT?

Center of Internet security expertise

Established in 1988 by the Department of Defense (DARPA) in 1988 on the heels of the Morris worm that created havoc on the ARPANET, the precursor to what is the Internet today

Located in the Software Engineering Institute (SEI)

- Federally Funded Research & Development Center (FFRDC)
- Operated by Carnegie Mellon University (Pittsburgh, Pennsylvania)

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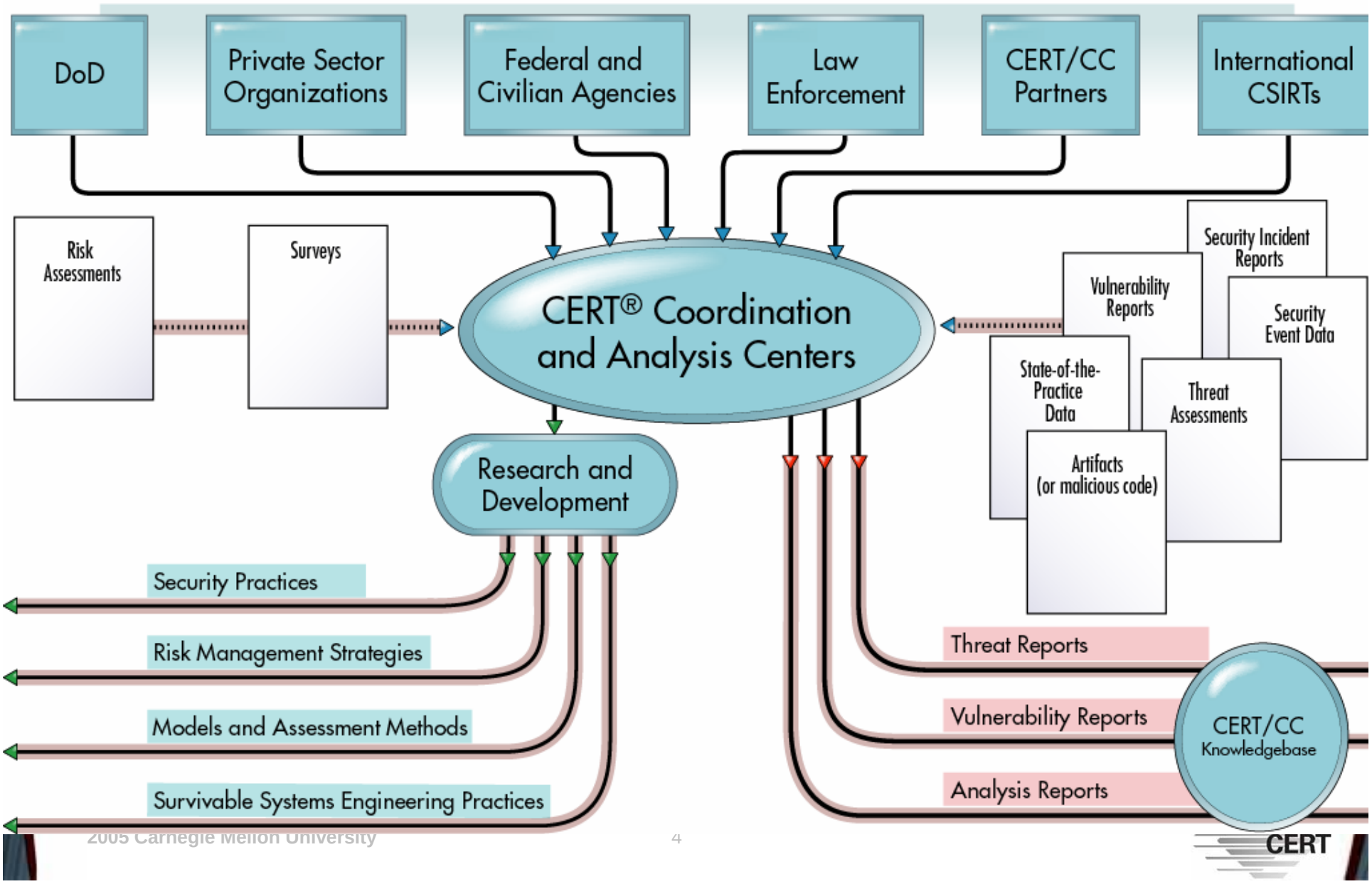
Security Information Flow

The CERT/CC gains a broad view of Internet security threats with data from many sources. CERT/CC analysts synthesize the data and publish timely, accurate information fast. Researchers develop long-term strategies to improve system security and survivability.



Are Insiders a Threat?

e-Crime Watch

CSO, USSS & CERT/CC

819 respondents

Average number of e-crimes in 2004: 86

35% increase in e–crimes in 2004

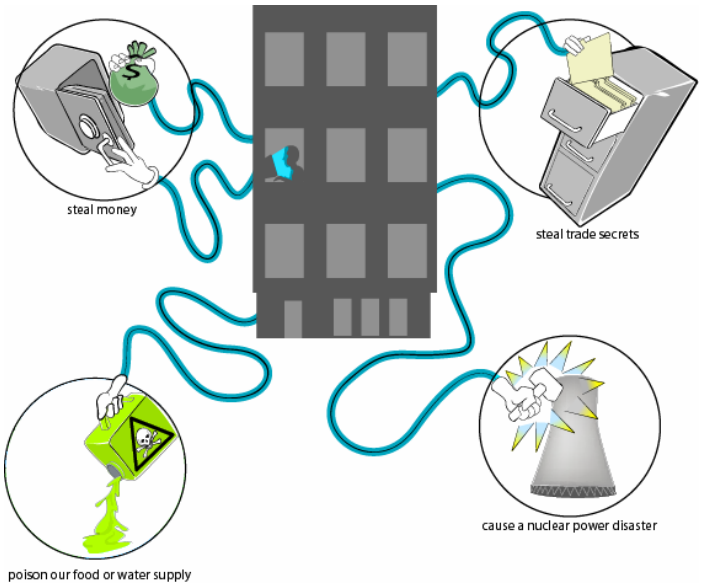
68% at least one e-crime or intrusion

39% of the organizations experienced one or more insider attacks or intrusions

20% of all attacks by insiders (versus outsiders)

"We'are all too paranoid, no point looking behind your back, we are already here."

Posted by: Anonymous



“idiocy to say the least
having been a statistic myself
i see that fear and stupidy prevail
nothing is secure
trust no-one
ever”

Posted by: C0rpR4t3_H4C|<

USSS/CERT Insider Threat Study

- Definition of insider
- Purpose of the study
- Study method
- Reports

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Study Definition of Insider

Current or former employees or contractors who

- intentionally exceeded or misused an authorized level of access to networks, systems or data in a manner that
- targeted a specific individual or affected the security of the organization's data, systems and/or daily business operations

Study Purpose

Identify information that was known or potentially detectable prior to the incident.

Analyze physical, social and online behaviors of insiders.

Develop information to help private industry, government and law enforcement better understand, detect and prevent harmful insider activity.

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Study Method

Incidents perpetrated by insiders in critical infrastructure sectors.

Initial incidents occurred between 1996 and 2002.

Reported publicly or investigated by the Secret Service.

Reviewed primary source material (investigative reports, court documents) and conducted supplemental interviews.

USSS/CERT Insider Threat Study

Definition of insider

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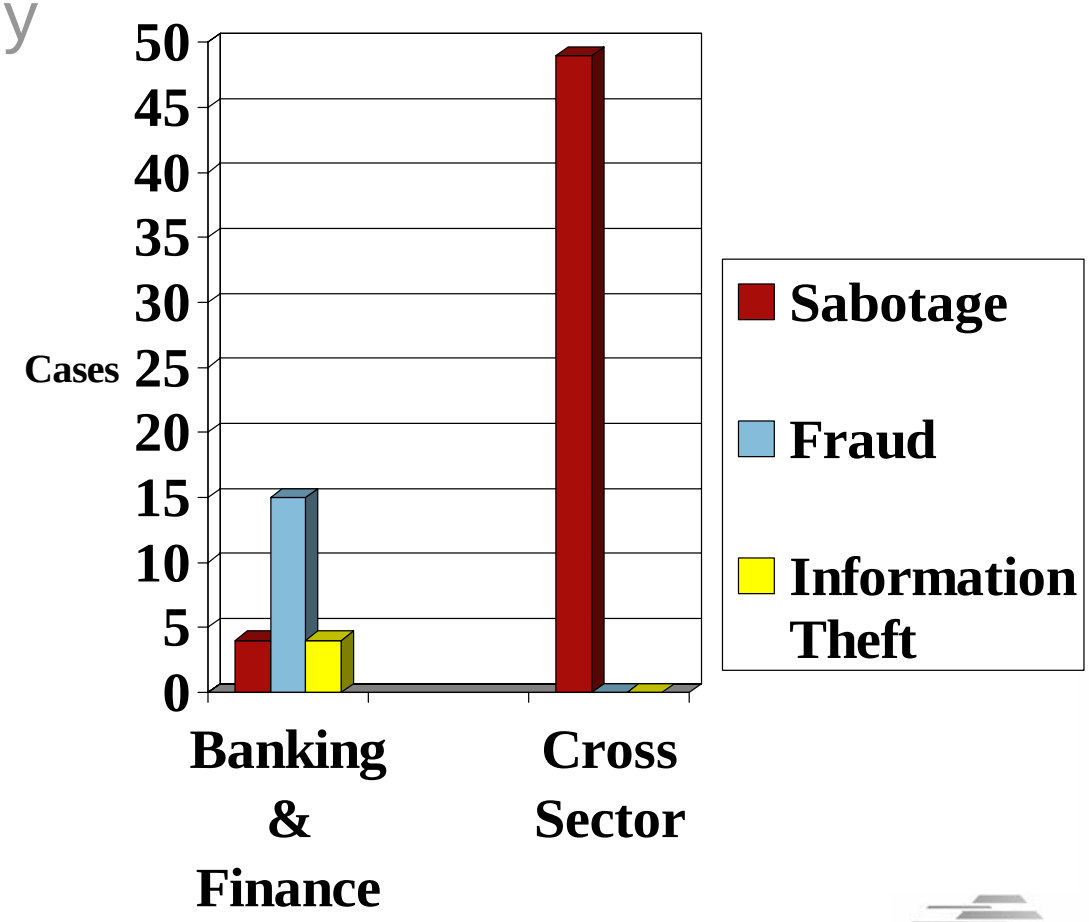


Insider Sabotage

Who were they?

Why did they do it?

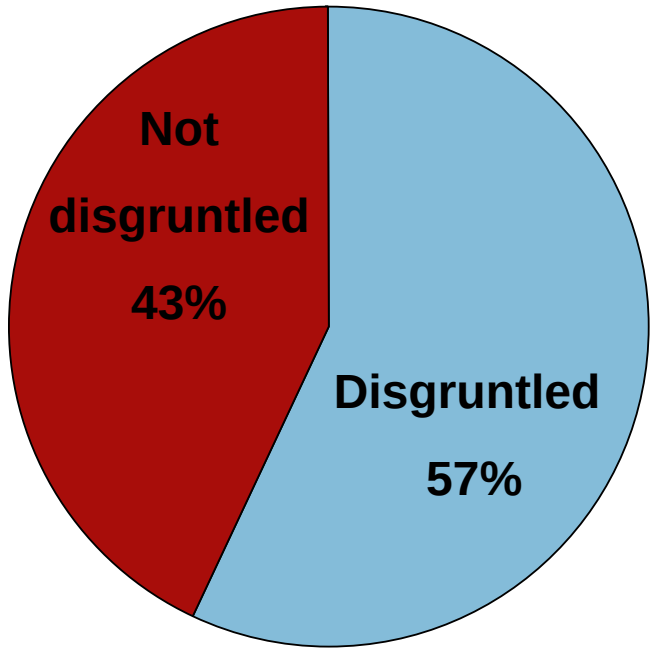
What were the consequences?

Best practices

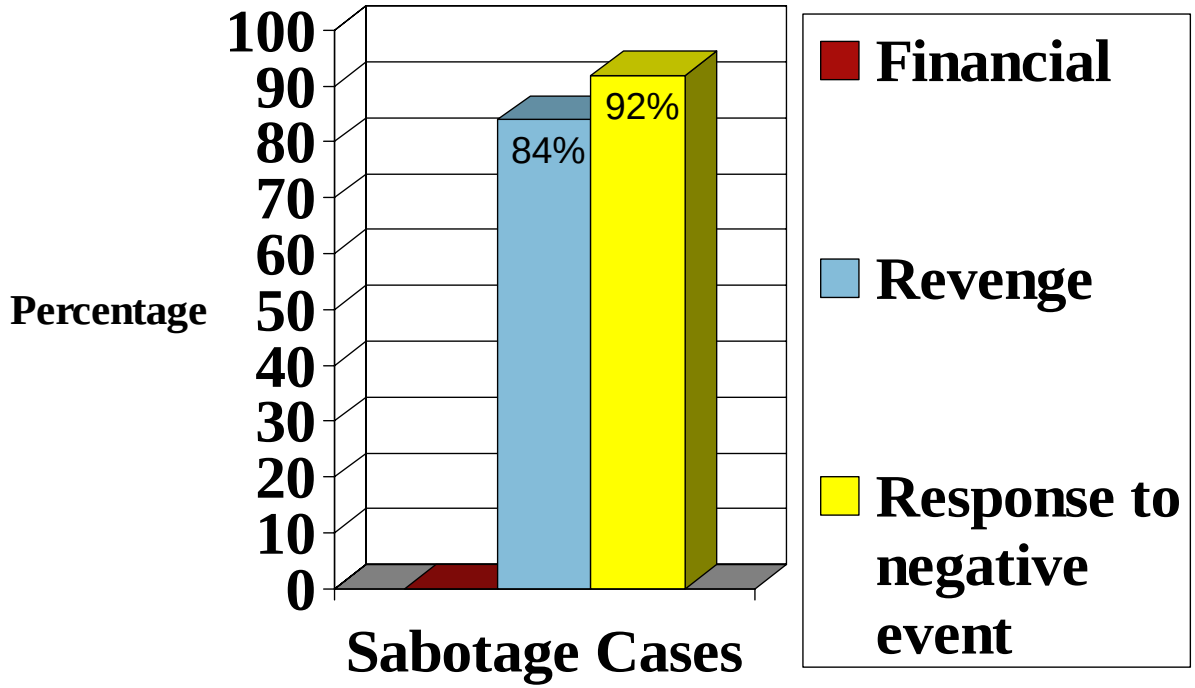
- Supporting Findings
- Case Examples

Who Were the Insiders?

- Male
- 17-60 years old
- About half married
- Variety of racial & ethnic backgrounds



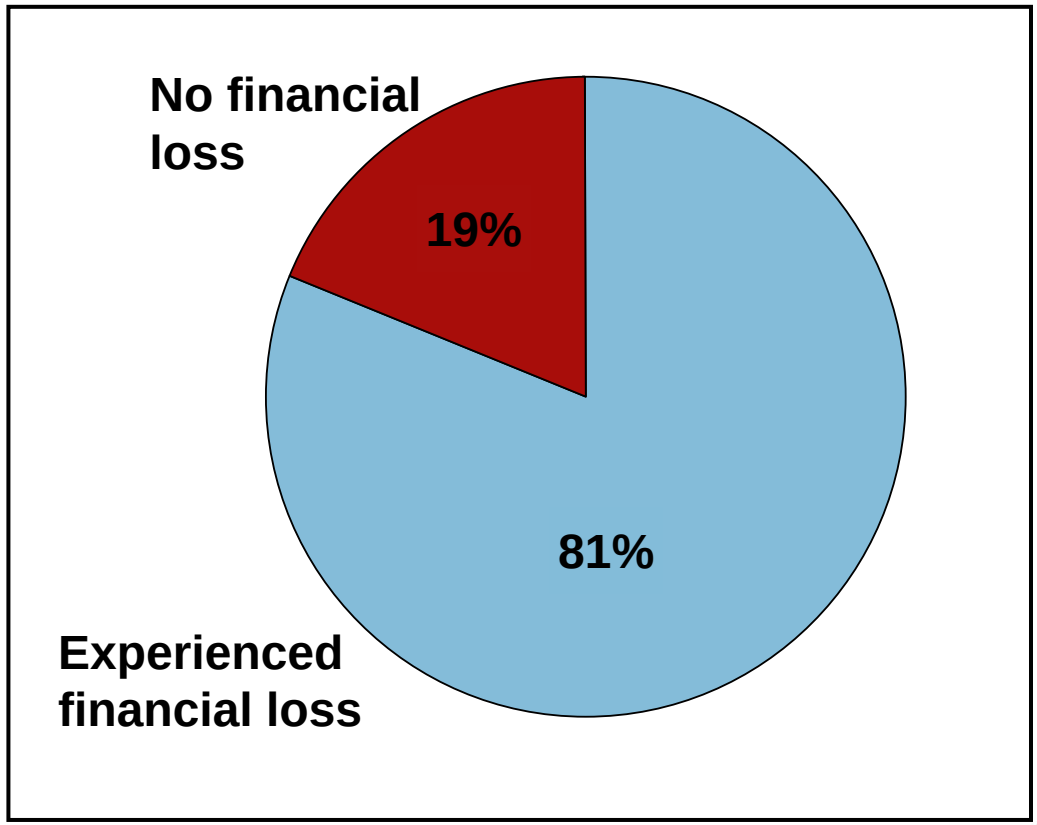
Primary Motive



Consequences to Targeted Organizations

Financial Loss

Harm to Individuals



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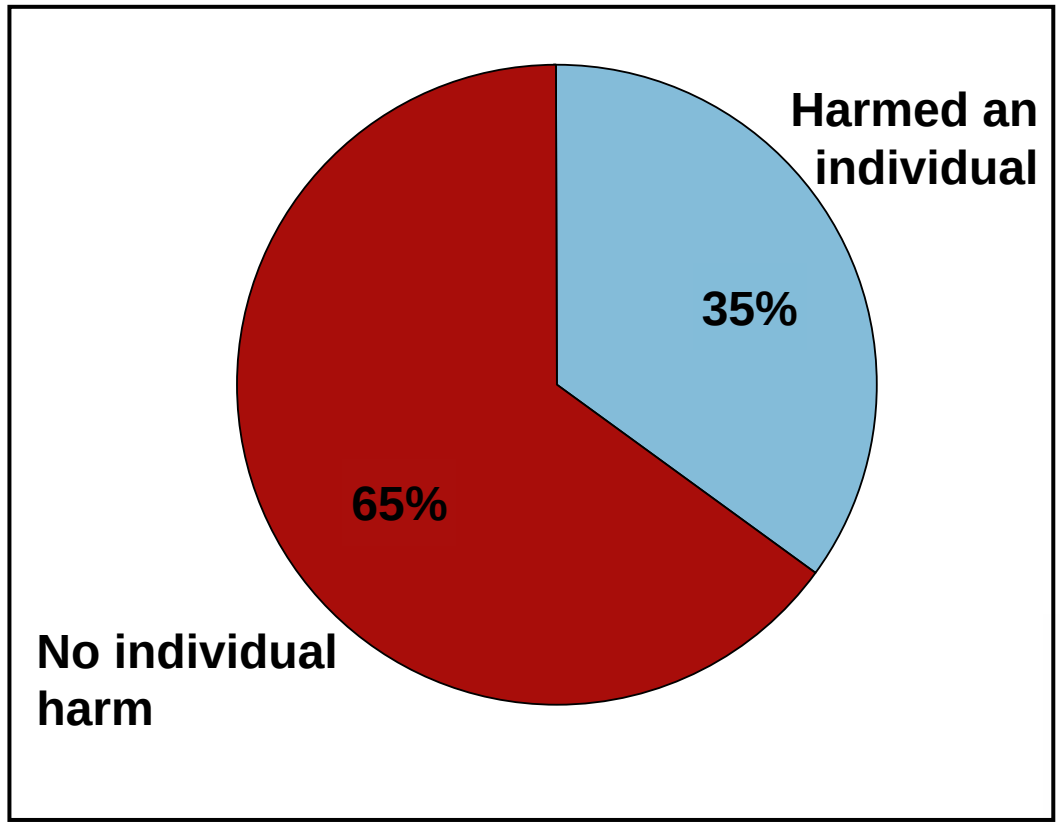
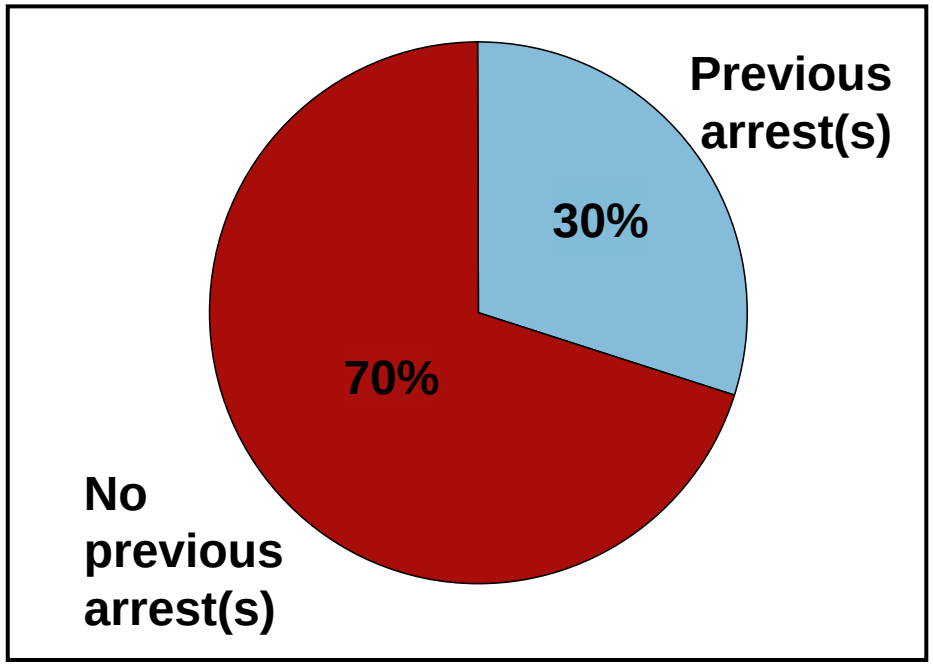


Best Practices

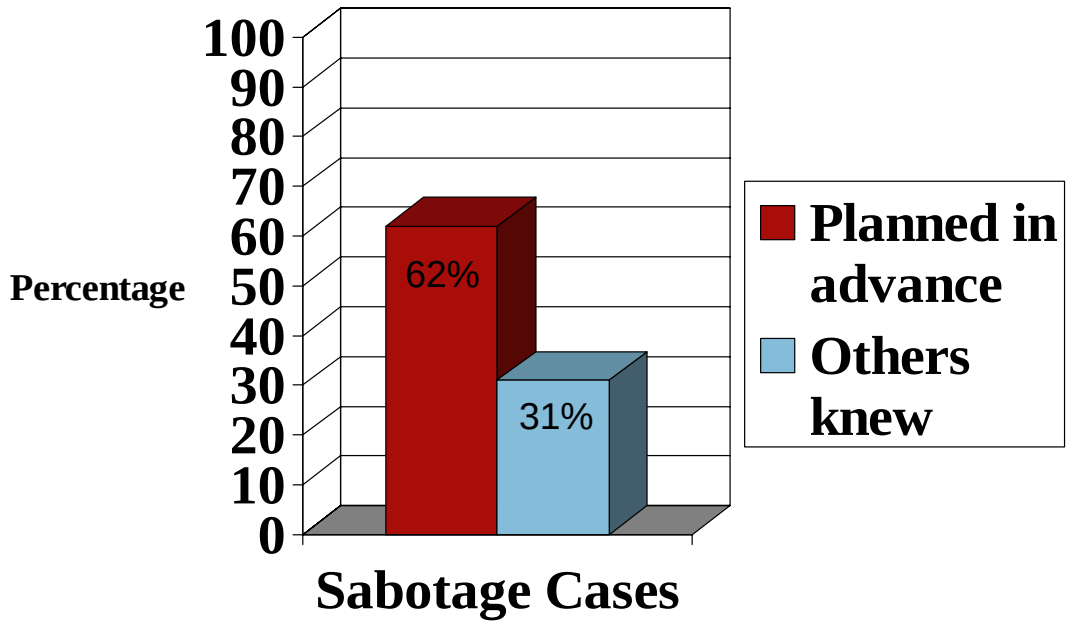
Background checks

Conduct background checks & consider results carefully.



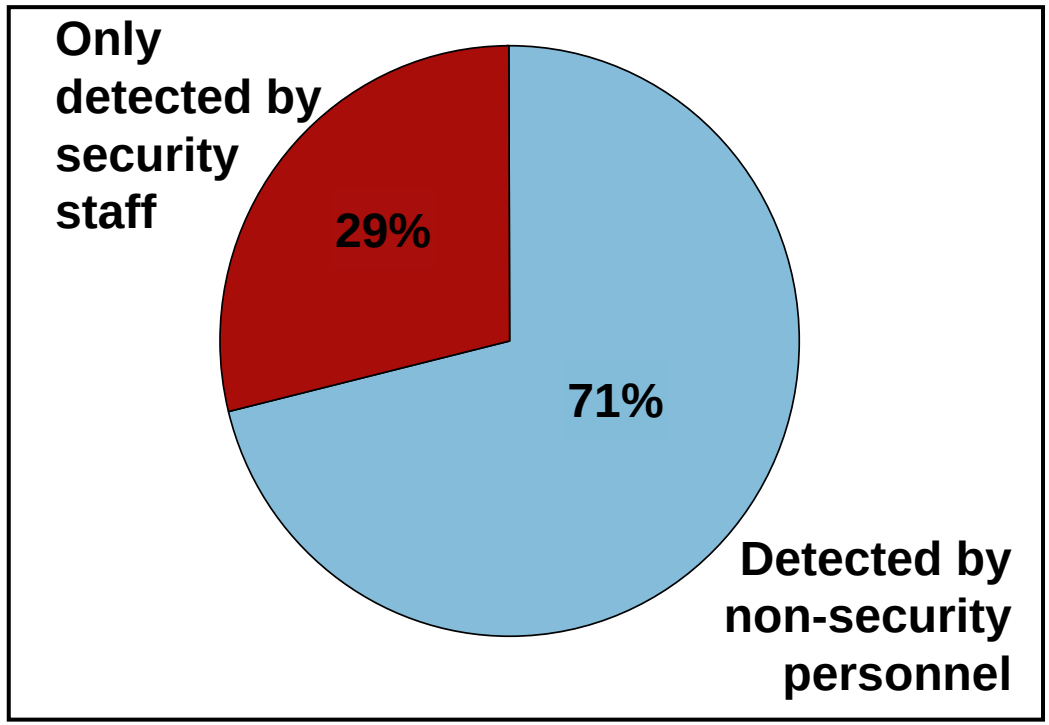
Security Awareness Training

Institute periodic employee security awareness training for all employees.



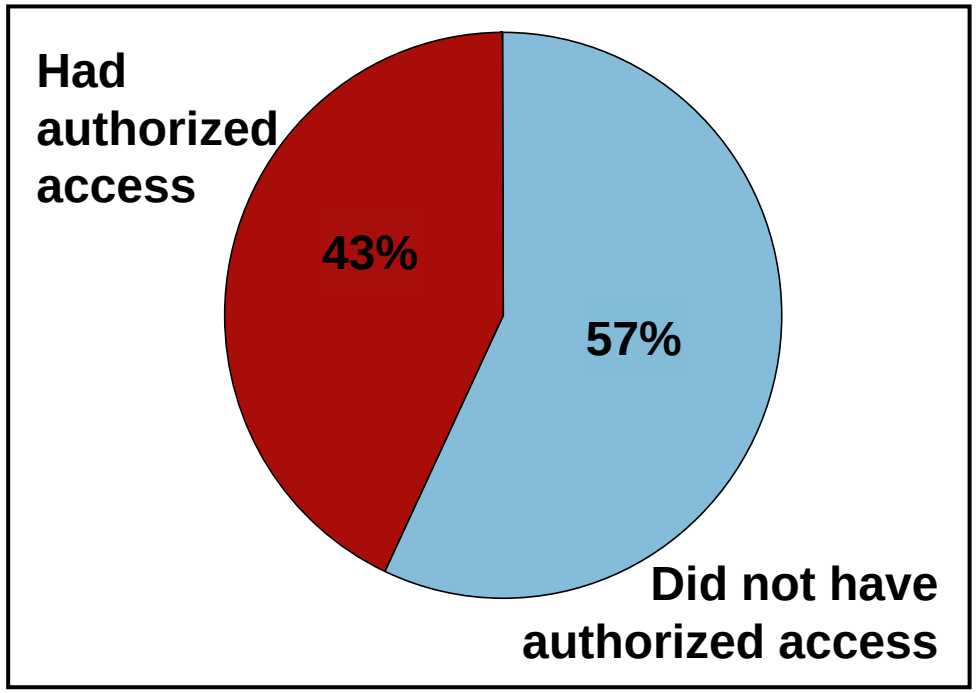
Separation of Duties

Enforce separation of duties and least privilege.



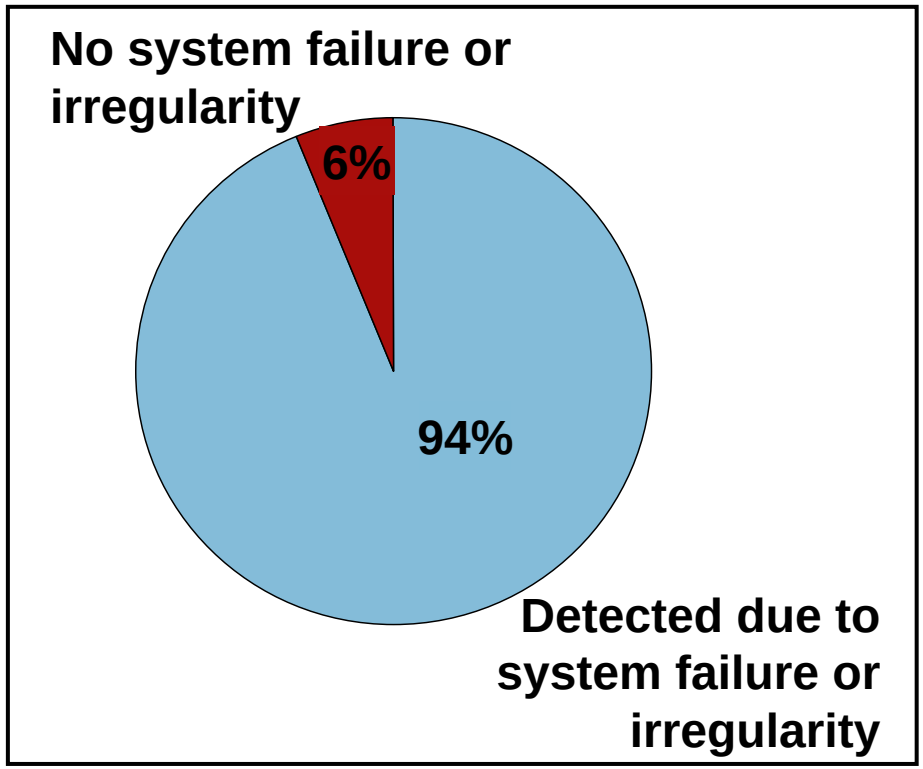
Password & Account Management

Implement strict password and account management policies and practices.



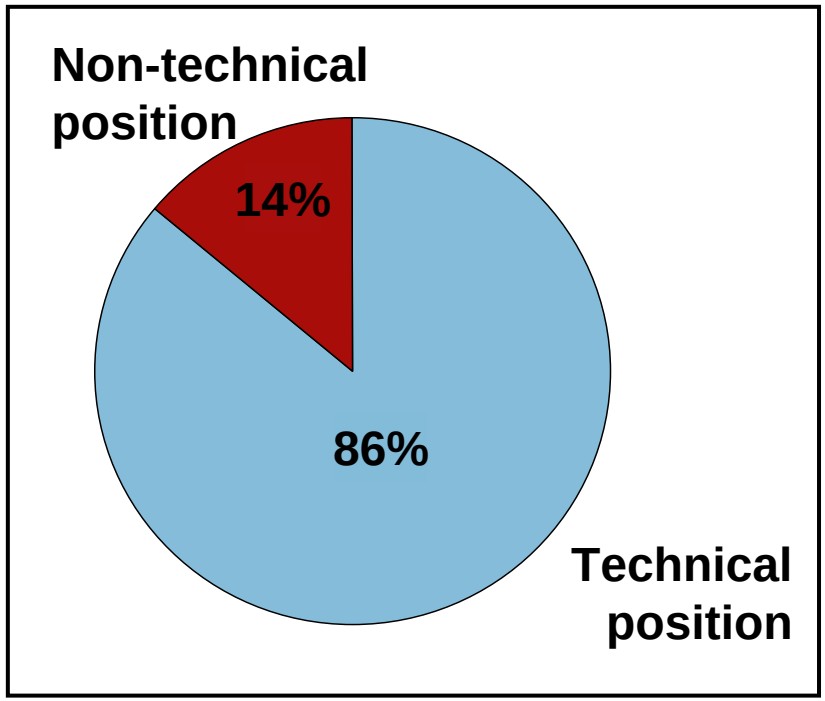
Monitoring

Log, monitor, and audit employee online actions.



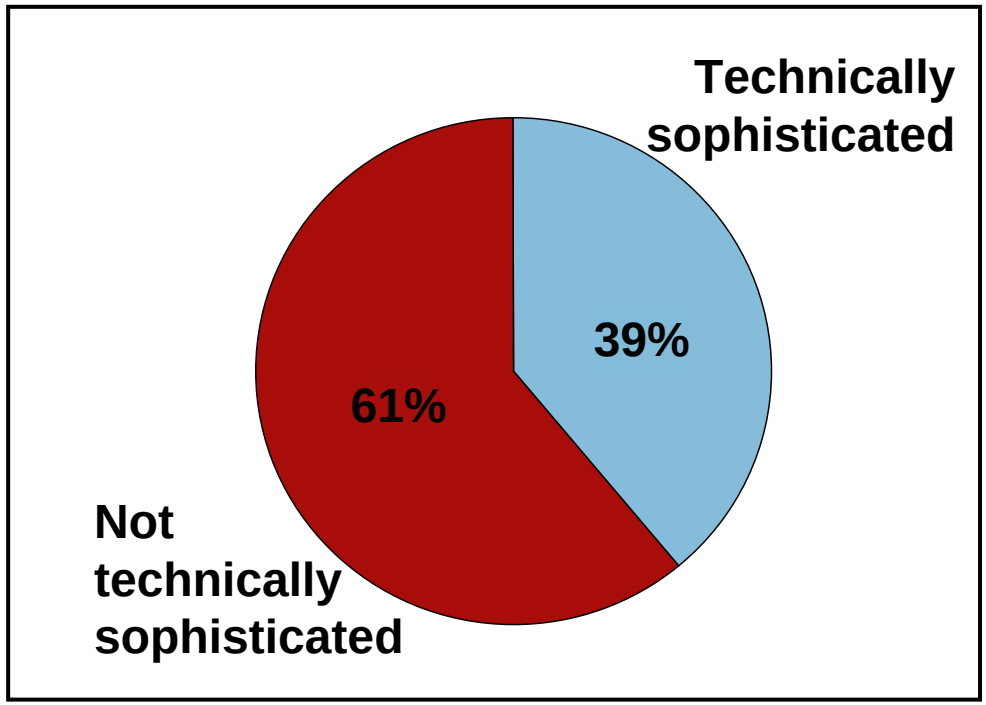
System Administrators

Use additional controls for system administrators and privileged users.



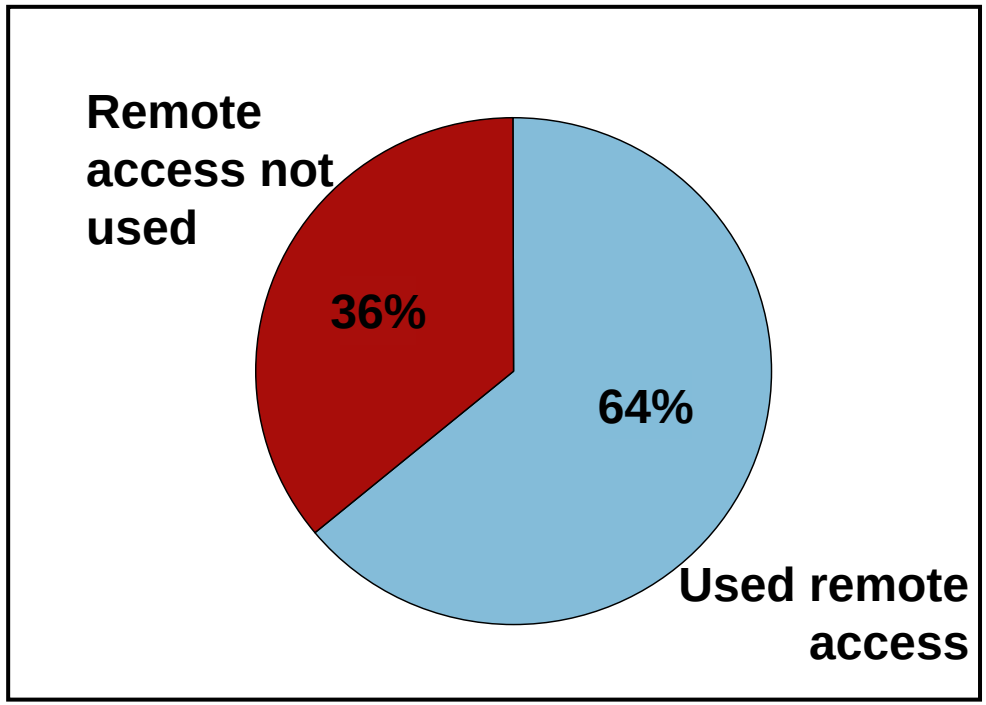
Malicious Code

Actively defend against malicious code.



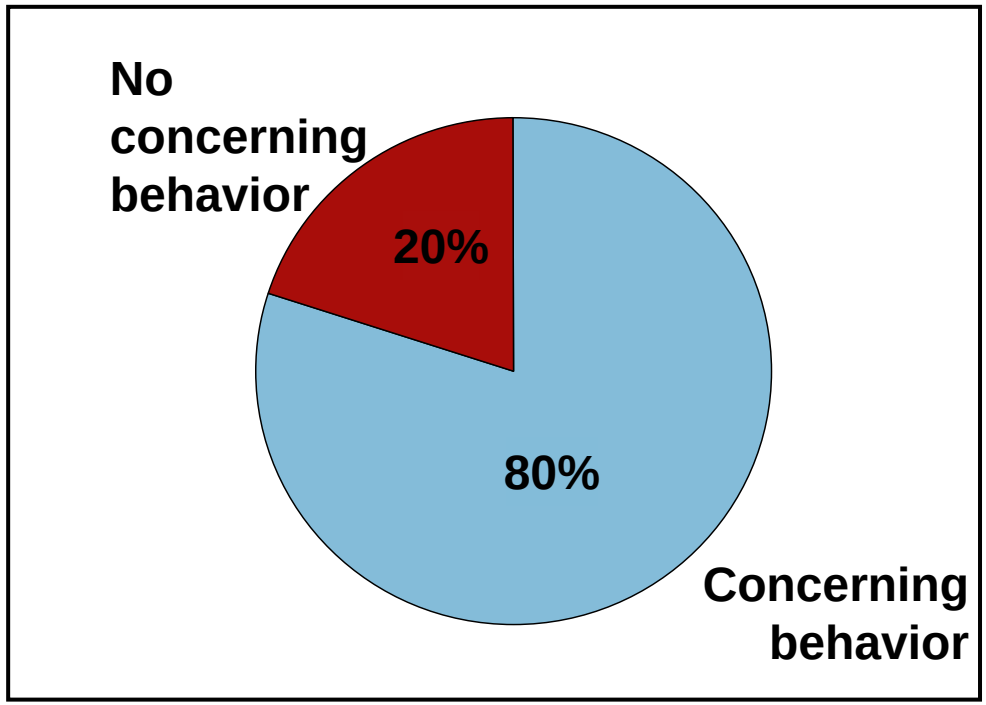
Remote Access

Use layered defense against remote attacks.



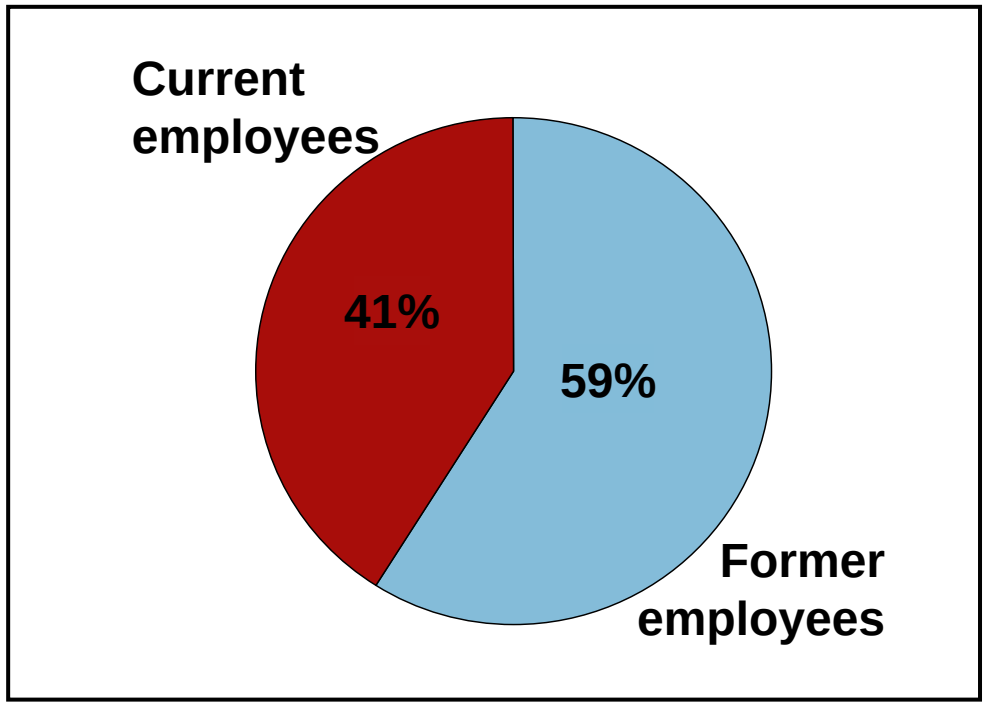
Suspicious Behavior

Monitor and respond to suspicious or disruptive behavior.



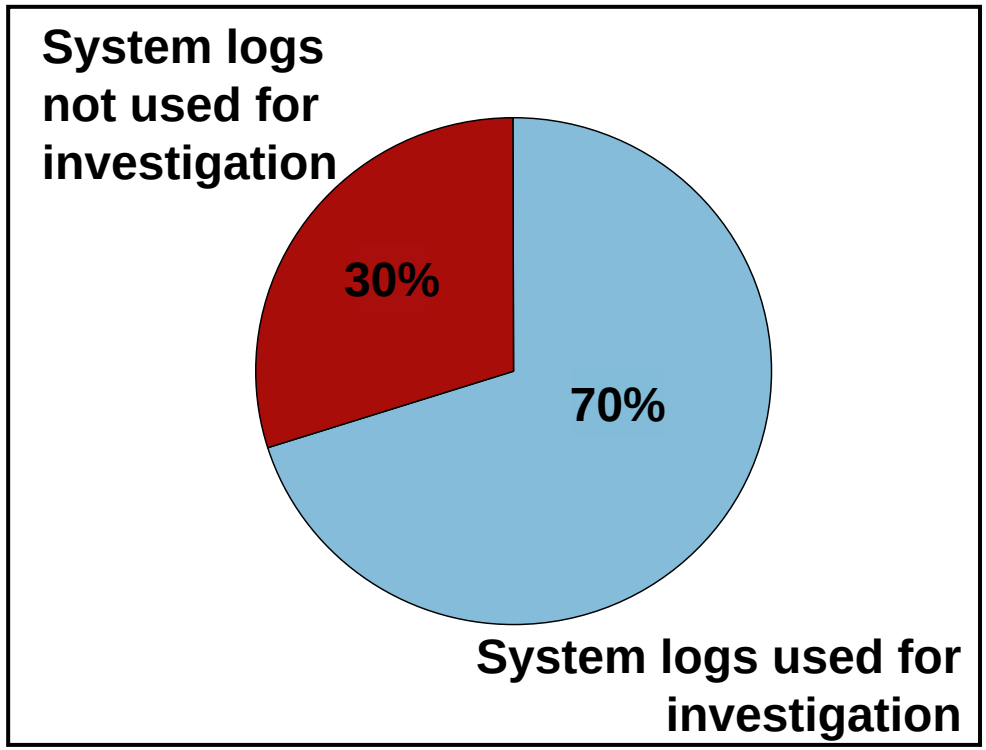
Access Following Termination

Deactivate access following termination.



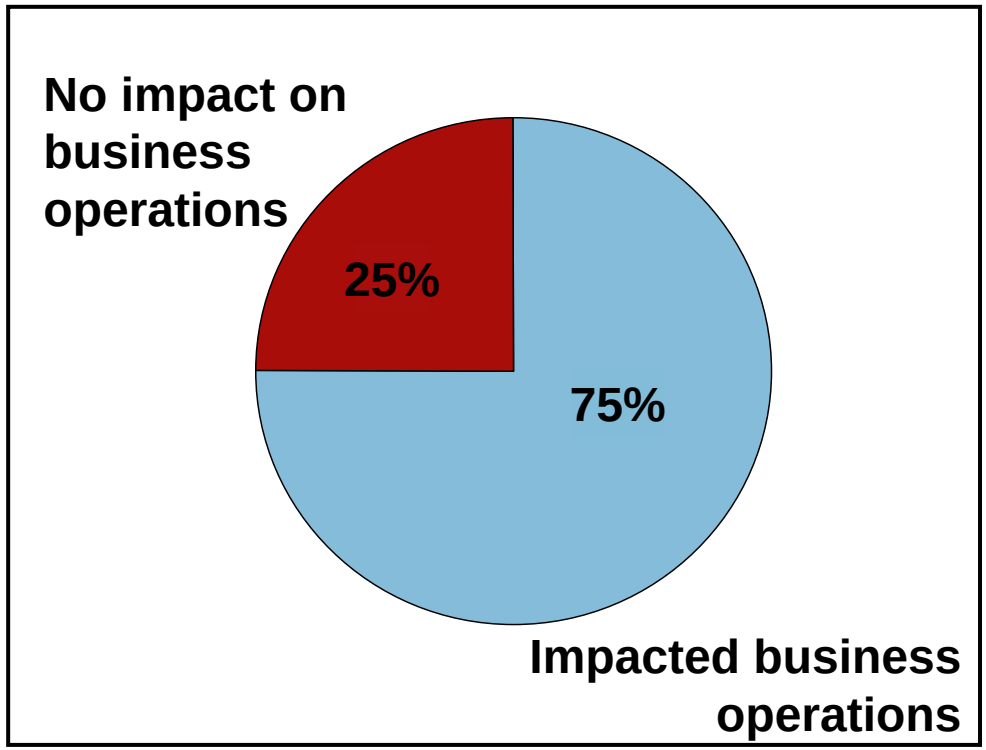
Investigation

Collect and save data for use in investigations.



Back Up & Recovery

Implement secure backup and recovery processes.



Formal Documentation

Clearly document insider threat controls.

"Most ITs I know, even the entry-level guys, install root kits as a first order of business when they join a company. They do it as a reflex, not because they have malicious intent or plan to hack the company, but to give themselves convenient access so they can work from home or school."

Posted by: Ben |

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Summary of Best Practices

Conduct background checks & consider results carefully.

Institute periodic employee security awareness training for all employees.

Enforce separation of duties and least privilege.

Implement strict password and account management policies and practices.

Log, monitor, and audit employee online actions.

Use additional controls for system administrators and privileged users.

Actively defend against malicious code.

Use layered defense against remote attacks.

Monitor and respond to suspicious or disruptive behavior.

Deactivate access following termination.

Collect and save data for use in investigations.

Implement secure backup and recovery processes.

Clearly document insider threat controls.

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What's Next

In progress:

- Additional "sector reports"
  - IT sector
  - Government sector
- Training – U.S. Secret Service Electronic Crimes Task Force meetings
- System Dynamics Modeling

Planned:

- Insider Threat Phase 2

System Dynamics Modeling

Model interaction over time between

- organizational culture
- organization's mission
- policies & procedures
- technology
- behavioral psychology

MERIT

Management Education on Risk of Insider Threat

Management Simulator for insider threat problem

Decision support system for management

Evaluate relative insider threat risk

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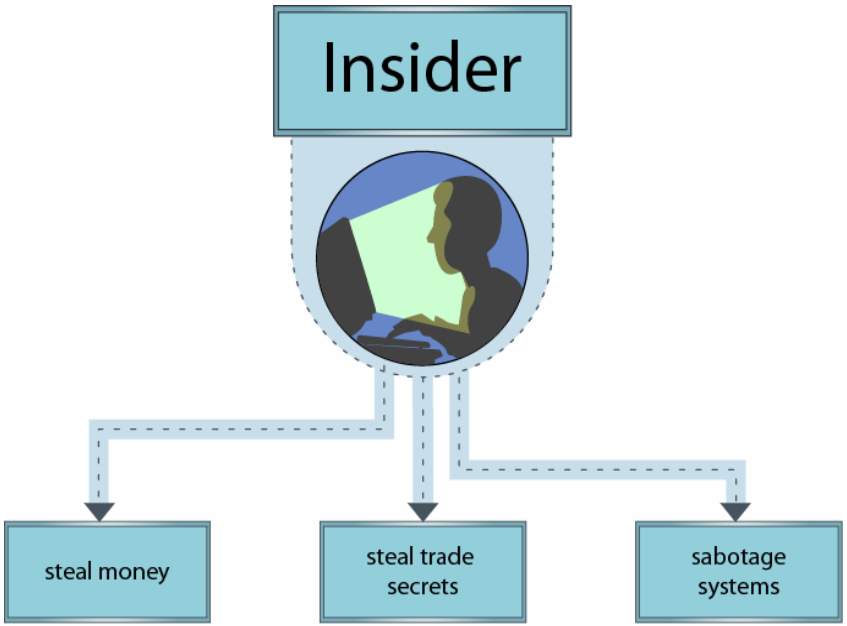
Insider Threat Phase 2

Collaborate with government and industry partners



"I worked at a medium-sized software company, and had root access to their main servers. Purely as an intellectual exercise, I thought about how I could most malliciously use that access. This is what I came up with:

> *Step 1: Hack the backup system: all backups are secretly encrypted as they are made, and decrypted when read back (so that checks of the backups shows nothing.)*
>
> *Step 2: Wait a year or more.*
>
> *Step 3: Wipe all the disks on the servers - including the hacked backup encryption/decryption software.*
>
> *Step 4: Send extortion demand for the encryption key to the backups. Unless they pay, they've lost years of work.*

Of course, I didn't actually try it, so I don't know if it would work..."

Posted by: Filias Cupio

Questions/Discussion