

Managing The Insider Threat: What Every Organization Should Know

8.8.13 • 9:00 AM ET-5:00 PM ET



Components and Considerations in Building an Insider Threat Program



Carly Huth
Insider Threat Researcher, CEWM

Carly L. Huth is an insider threat researcher in the Cyber Enterprise and Workforce Management Directorate in the CERT Program at the Software Engineering Institute (SEI). Huth's current areas of research include the intersections of privacy and technology as well as the effects of the current regulatory environment on insider threat prevention practices.



Robin Ruefle
Technical Staff - CERT

Robin Ruefle is a member of the technical staff of the CERT Program at the Software Engineering Institute (SEI) at Carnegie Mellon University. Ruefle has co-authored: Handbook for CSIRTs 2nd Edition, Organizational Models for CSIRTs Handbook, CSIRT Services List, State of the Practice of CSIRTs, Defining Incident Management Processes for CSIRTs: A Work in Progress, and numerous other articles and guides.



Software Engineering Institute

Carnegie Mellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter [#CERTinsidethreat](#)
© 2013 Carnegie Mellon University

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 08 AUG 2013		2. REPORT TYPE		3. DATES COVERED 00-00-2013 to 00-00-2013	
4. TITLE AND SUBTITLE Components and Considerations in Building an Insider Threat Program				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Carnegie Mellon University,Software Engineering Institute,Pittsburgh,PA,15213				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 22	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

Motivation for a Program

“to ensure the responsible sharing and safeguarding of classified national security information on computer networks.”

Source: [Executive Order 13587](#), quoted in [GCN](#) (<http://s.tt/1ai6l>)

To ensure protection of and appropriate access to intellectual property and other critical assets, systems, and data

To be prepared and ready to handle such events in a consistent, timely, and quality manner including understanding

- who to involve
- who has authority
- who to coordinate with
- who to report to
- what actions to take
- what improvements to make

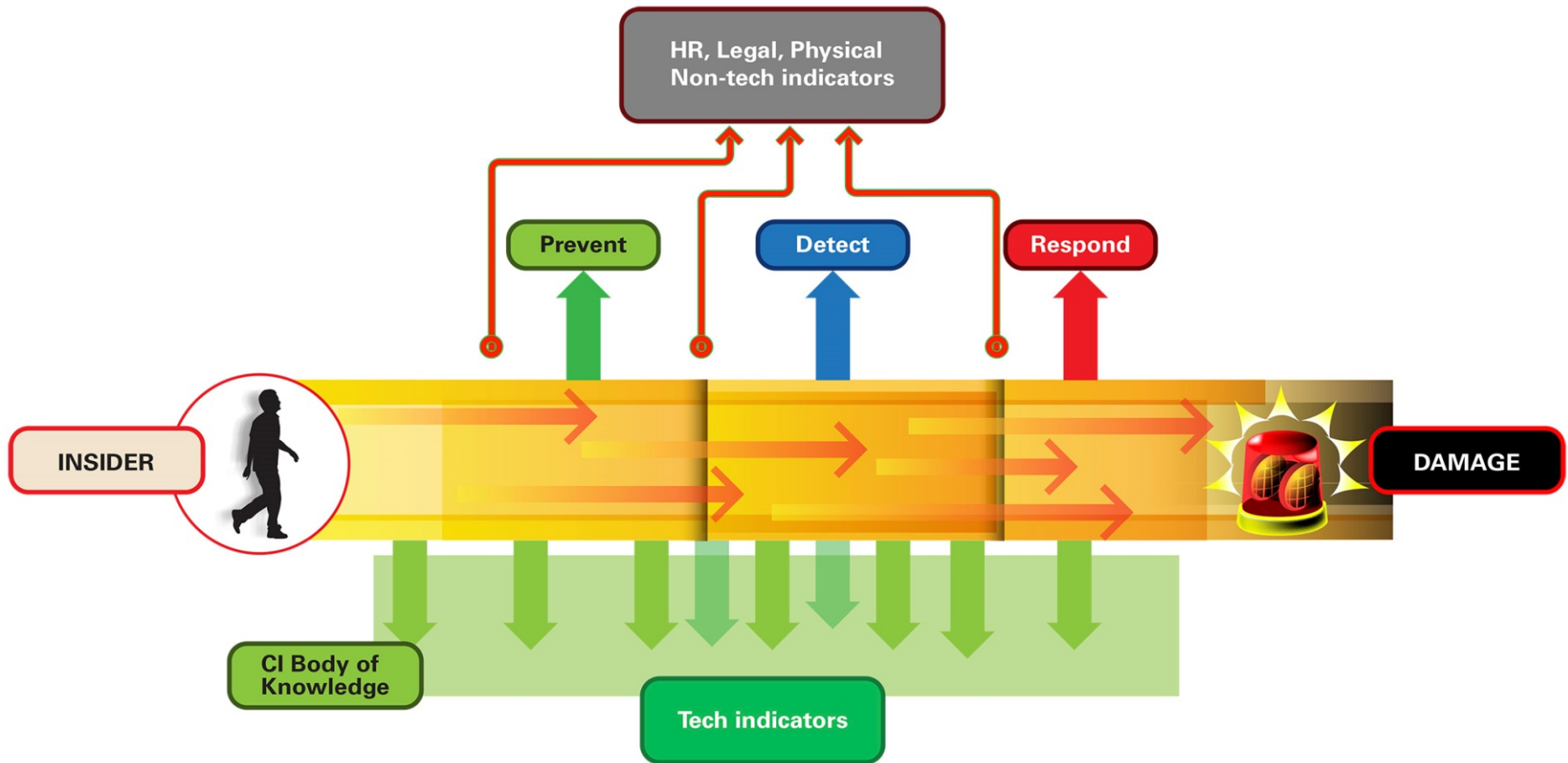


Software Engineering Institute

Carnegie Mellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter [#CERTinsidethreat](#)
© 2013 Carnegie Mellon University

Goal for a Program



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



Software Engineering Institute

Carnegie Mellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter [#CERTinsidethreat](#)
© 2013 Carnegie Mellon University

Component Overview

- Cross-enterprise project planning and implementation group
- Designated staff to manage and operate the Insider Threat Program
- Multi-level training and awareness program
- Infrastructure support
 - Cross-organizational data collection and analysis
 - Incident Response Plan
 - Policies, procedures, and practices created or enhanced to support insider threat program
 - Protection of civil liberties and privacy rights

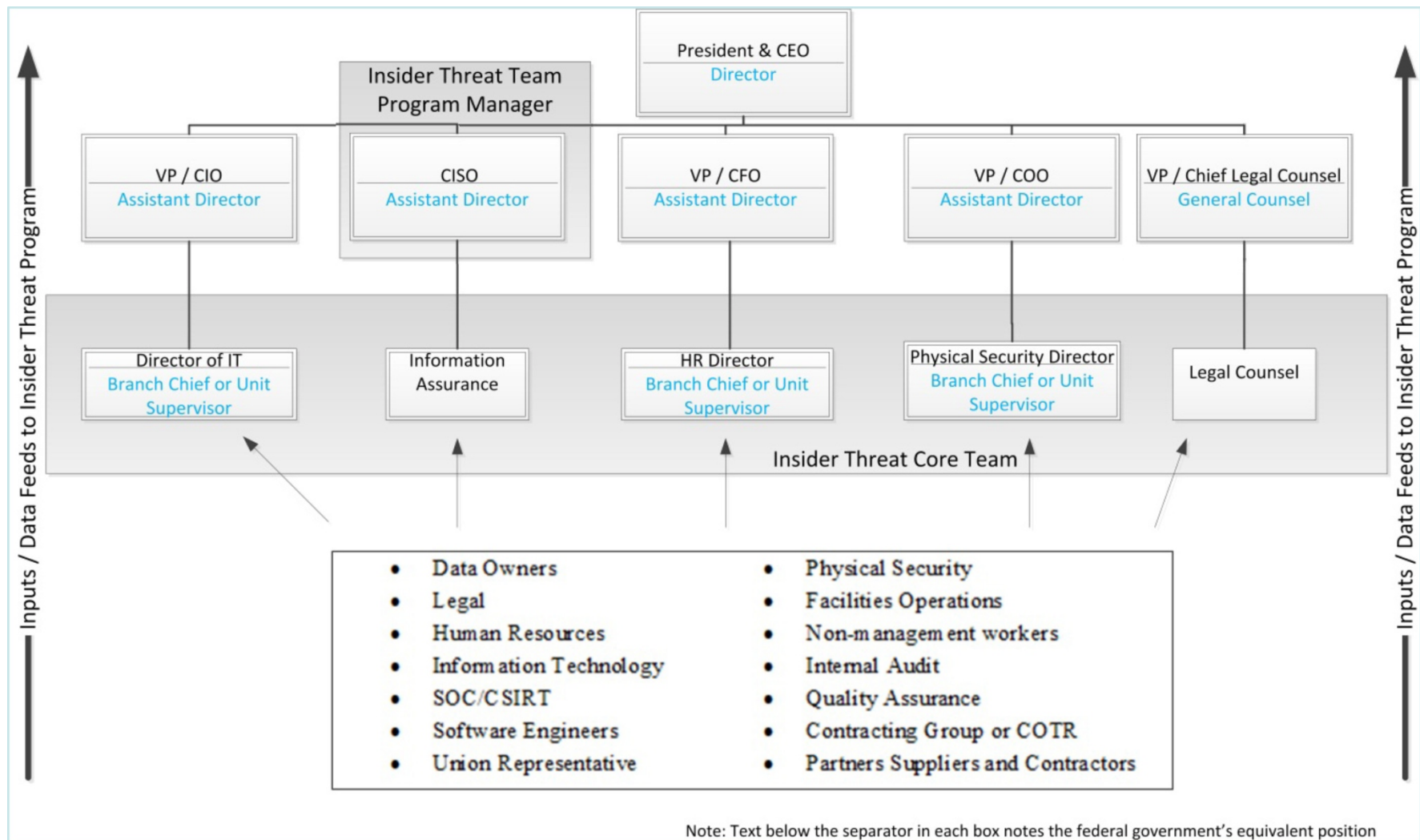


Software Engineering Institute

Carnegie Mellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter [#CERTinsiderthreat](#)
© 2013 Carnegie Mellon University

Insider Threat Program Participants (**Notional**)



Multi-level Training and Awareness

General awareness, training, and refreshers for all staff

- Definitions for insider threat
- Types of insider threat crimes and activities and motivations
- How staff can be targeted and social engineered
- When, how, and what to report – regarding suspicious human or computer activity
- Acceptable use policy and repercussions for violation
- Responsibility for protecting IP, data, and systems and for reporting

Role based training for areas of the organization

- HR
- Legal
- IT and Security
- Facilities

Specific training for Insider Threat Program staff



Software Engineering Institute

CarnegieMellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter [#CERTinsiderthreat](#)
© 2013 Carnegie Mellon University

Infrastructure Support

Prevention and Detection

- Data loss prevention
- Monitoring, filtering, blocking

Data Collection and Analysis

- Synthesis and aggregation
- Correlation
- Repository for data analysis



Software Engineering Institute

Carnegie Mellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter [#CERTinsiderthreat](#)
© 2013 Carnegie Mellon University

Data Aggregation and Analysis

Determine types of data to be collected

Supporting authority and permission

Methods for obtaining data

Criteria for user monitoring

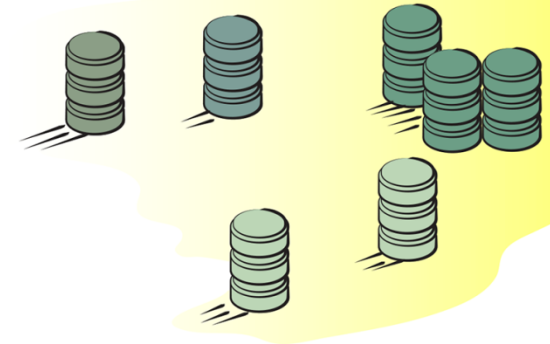
- Privileged users
- Role based
- Asset based

Criteria for suspicious or potential malicious behavior

Scoring criteria

Alerting mechanisms

Escalation mechanisms



Software Engineering Institute

Carnegie Mellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter [#CERTinsiderthreat](https://twitter.com/CERTinsiderthreat)
© 2013 Carnegie Mellon University

Incident Response Plan

How incidents perpetrated by insiders are

- Detected
- Reported
- Contained
- Remediated
- Documented
- Prosecuted (if applicable)

How processes change for different types of threats:

- Fraud
- Theft of IP
- Sabotage
- Espionage

How processes change when involvement includes

- Contracts and SLAs
- Unions
- Privileged users
- Cloud computing servers and data centers



Software Engineering Institute

Carnegie Mellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter [#CERTinsiderthreat](#)
© 2013 Carnegie Mellon University

Response Options

Internal

- Retraining
- Personnel actions
- Organizational sanctions
- Legal actions

External

- Referral to internal investigative unit or counter intelligence (if applicable)
- Referral to local or federal law enforcement if applicable

Response Considerations

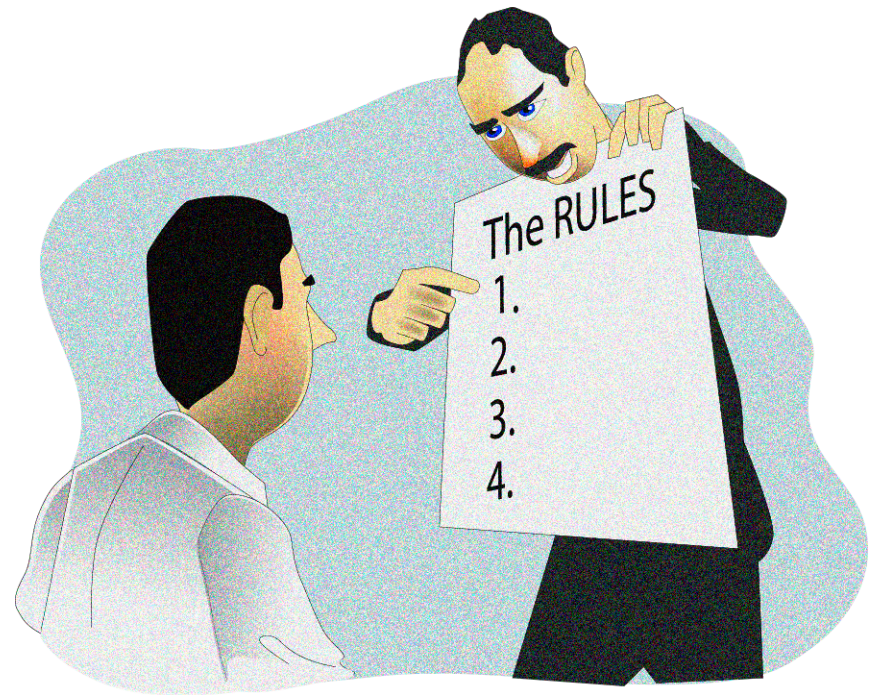
- Think about response to precursors not just to incidents that have occurred.
- Responses must be documented and practiced consistently
- All response procedures should be coordinated with General Counsel
- Privacy and civil liberties must be consider at all times



Policies, Procedures, and Practices

Examples include but are not limited to:

- Reporting
 - Confidential reporting mechanism
 - Requirement to report
- Information Technology
 - Acceptable use
 - Separation of duties
 - Code reviews
 - Least privilege
 - No shared accounts
 - Change control
 - Configuration management



Criminal Background Screening Best Practices

Practices apply to all employment decisions, including promotions

Even neutral policies can impact certain groups of candidates more than others; generally, policies shouldn't automatically exclude all candidates with criminal history

Be cautious when using arrest records, conviction records provide better evidence

Train all relevant staff about complying with the equal employment laws and keep all candidate criminal information confidential



Software Engineering Institute

Carnegie Mellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter [#CERTinsiderthreat](#)
© 2013 Carnegie Mellon University

Criminal Background Screening Best Practices

Screenings should be job related and consistent with a business need

Often, a 'targeted screening' is recommended, where the employer considers:

- The nature of the crime
- How long ago the crime took place
- The nature of the job

Best Practices Adapted from the Equal Employment Opportunity Commission's Enforcement Guidance on the Consideration of Arrest and Conviction Records in Employment Decisions Under Title VII of the Civil Rights Act of 1964.



Software Engineering Institute

CarnegieMellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter [#CERTinsiderthreat](#)
© 2013 Carnegie Mellon University

6 Essential Legal Considerations

Create, maintain and enforce acceptable use and monitoring policies

Obtain employee acknowledgement of policies and communicate any updates

Don't rely solely on policies; protect proprietary information through technical measures such as access controls



Software Engineering Institute

Carnegie Mellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter [#CERTinsiderthreat](#)
© 2013 Carnegie Mellon University

6 Essential Legal Considerations

Consider the need to review logs for evidence when creating your data retention policies

Be cautious of performing your own investigations, make sure to preserve evidence

Be prompt when issuing a legal response



Considerations adapted from: Chickowski, [5 Ways to Lose a Malicious Insider Lawsuit](http://www.darkreading.com/insider-threat/167801100/security/news/240000436/five-ways-to-lose-a-malicious-insider-lawsuit.html?cid=nl_DR_daily_2012-05-16_html&elq=c5ac1d36f4564d6bbe7fa410608fb160), available at: http://www.darkreading.com/insider-threat/167801100/security/news/240000436/five-ways-to-lose-a-malicious-insider-lawsuit.html?cid=nl_DR_daily_2012-05-16_html&elq=c5ac1d36f4564d6bbe7fa410608fb160



Software Engineering Institute

Carnegie Mellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter **#CERTinsiderthreat**
© 2013 Carnegie Mellon University



Summary



Software Engineering Institute

Carnegie Mellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter [#CERTinsiderthreat](#)
© 2013 Carnegie Mellon University

Implementation Strategy

First 30-90 Days

- Obtain buy-in from top management
- Designate a senior manager to be the Insider Threat Program Manager
- Create a working group to plan the project and implementation (include representative from key areas)
- Collect information on what is already in place and can be leveraged
- Talk to others who have programs, research recommendations
- Identify the organizational structure of an enterprise Insider Threat Program
- Identify roles and responsibilities for the program

Next 90-180 Days

- Develop staffing requirements, competencies, and a workforce management plan
- Develop initial training requirements and materials
- Architect data collection, aggregation, and analysis methodology and tools

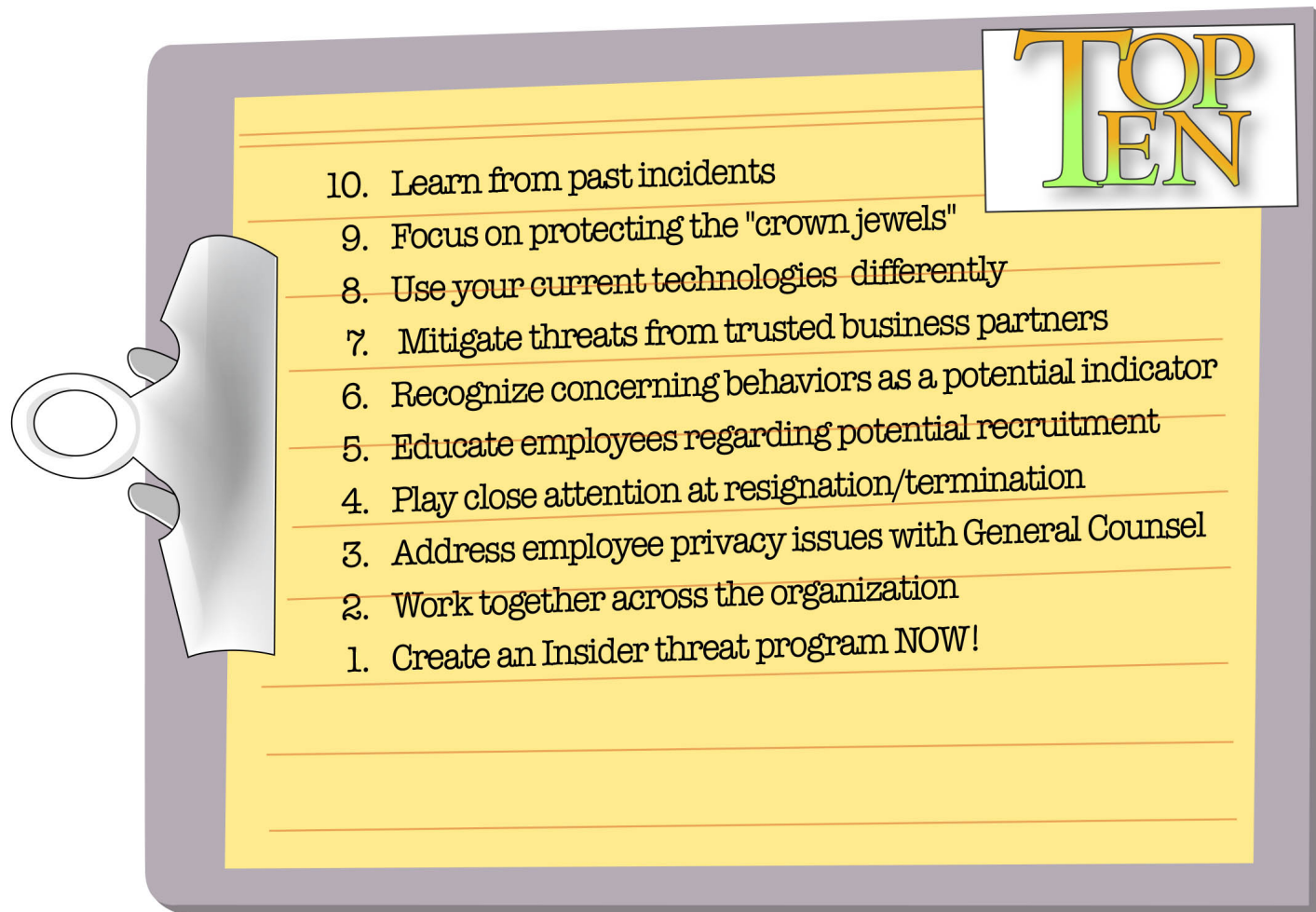


Software Engineering Institute

CarnegieMellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter [#CERTinsiderthreat](#)
© 2013 Carnegie Mellon University

The CERT Top 10 List for Winning the Battle Against Insider Threats



Software Engineering Institute

Carnegie Mellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter [#CERTinsiderthreat](#)
© 2013 Carnegie Mellon University



Resources



Software Engineering Institute

Carnegie Mellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter #CERTinsidethreat
© 2013 Carnegie Mellon University

CERT Resources

Insider Threat Center website
(http://www.cert.org/insider_threat/)

Common Sense Guide to Mitigating Insider Threats, 4th Ed.
(<http://www.sei.cmu.edu/library/abstracts/reports/12tr012.cfm>)

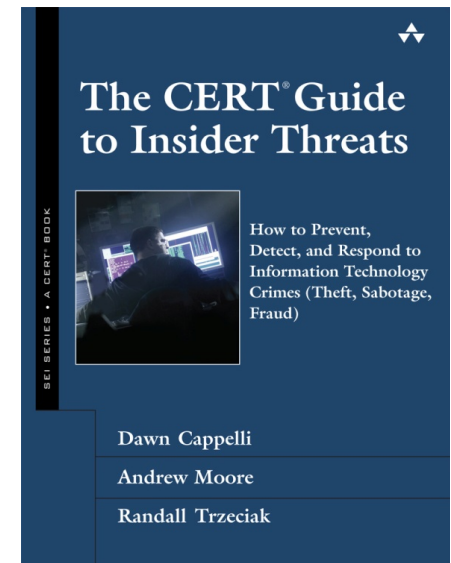
The Insider Threat and Employee Privacy: An Overview of Recent Case Law, Computer Law and Security Review, Volume 29, Issue 4, August 2013 by Carly L. Huth

Insider threat workshops

Insider threat assessments

New controls from CERT Insider Threat Lab

Insider threat exercises



[The CERT® Guide to Insider Threats: How to Prevent, Detect, and Respond to Information Technology Crimes \(Theft, Sabotage, Fraud\) \(SEI Series in Software Engineering\)](#) by Dawn M. Cappelli, Andrew P. Moore and Randall F. Trzeciak



Software Engineering Institute

Carnegie Mellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter [#CERTinsiderthreat](#)
© 2013 Carnegie Mellon University

Points of Contact

Robin M. Ruefle
Technical Team Lead, ETVM
Organizational Solutions
CERT Program, Software Engineering
Institute
Phone: +1 412 268-6752
Email: rmr@cert.org

Carly L. Huth
Member of the Technical Staff, ETVM
CERT Program, Software Engineering
Institute
Phone: +1 412 268-5760
Email: clhuth@cert.org



Software Engineering Institute

Carnegie Mellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter [#CERTinsiderthreat](https://twitter.com/CERTinsiderthreat)
© 2013 Carnegie Mellon University

Copyright 2013 Carnegie Mellon University

This material is based upon work funded and supported by the Department of Defense under Contract No. FA8721-05-C-0003 with Carnegie Mellon University for the operation of the Software Engineering Institute, a federally funded research and development center.

Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of AFCEA or the United States Department of Defense.

NO WARRANTY. THIS CARNEGIE MELLON UNIVERSITY AND SOFTWARE ENGINEERING INSTITUTE MATERIAL IS FURNISHED ON AN “AS-IS” BASIS. CARNEGIE MELLON UNIVERSITY MAKES NO WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED, AS TO ANY MATTER INCLUDING, BUT NOT LIMITED TO, WARRANTY OF FITNESS FOR PURPOSE OR MERCHANTABILITY, EXCLUSIVITY, OR RESULTS OBTAINED FROM USE OF THE MATERIAL. CARNEGIE MELLON UNIVERSITY DOES NOT MAKE ANY WARRANTY OF ANY KIND WITH RESPECT TO FREEDOM FROM PATENT, TRADEMARK, OR COPYRIGHT INFRINGEMENT.

This material has been approved for public release and unlimited distribution except as restricted below.

This material may be reproduced in its entirety, without modification, and freely distributed in written or electronic form without requesting formal permission. Permission is required for any other use. Requests for permission should be directed to the Software Engineering Institute at permission@sei.cmu.edu.

Carnegie Mellon® is registered in the U.S. Patent and Trademark Office by Carnegie Mellon University.

DM-0000552



Software Engineering Institute

CarnegieMellon

Managing The Insider Threat:
What Every Organization Should Know
Twitter #CERTinsiderthreat
© 2013 Carnegie Mellon University