Carnegie Mellon
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CERT
Situational
Awareness

Data Sharing: Lessons learned by the CERT/CC and the CERT/NetSA groups

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FloCon 2004: Data Sharing Panel

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The CERT Network Situational Awareness Group is part of the Software Engineering Institute. The Software Engineering Institute is sponsored by the U.S. Department of Defense.

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
JUL 2004		**00-00-2004 to 00-00-2004**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Data Sharing: Lessons learned by the CERT/CC and the CERT/NetSA groups	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
presented at FloCon 2004, Crystal City, VA, July 2004.

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**Same as Report (SAR)**	**13**	

Background

- CERT/CC has a long history of accepting incident reports, artifacts, and vulnerability information
  - Synthesizing this input into public analysis such as advisories and the coordination of patch releases
- CERT/SA has experience in analyzing operational data-sets of other organizations
  - Synthesizing these data-sets to form situational awareness, and new analytical approaches

Decomposing “Data Sharing”

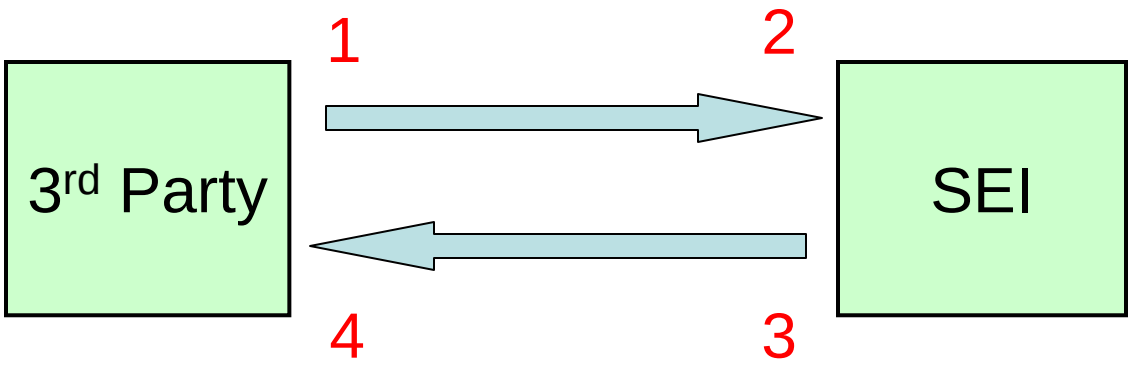
- Data collection
  - Accepting data from outside your organization
- Data dissemination
  - Providing value-add back to data sources or constituency

An organization only involved in data collection is not “data sharing”

Concerns in Sharing

- Concerns for the data source
  - Is anything “sensitive” being released?
    - If so, what assurances do I have about my data?
  - Is there sufficient benefit to me in providing this information?
- Concerns for the data recipient
  - Is there any risk in accepting this information?
    - Does the data source know it is a data source?
    - Can others know that this data source is being used?
    - What responsibilities do I have with respect to handling/sharing this information with others?
  - Is there sufficient benefit to collecting this information?

Steps in the Sharing Process



(1) I am reporting data to CERT

- Sharing data is technologically hard and requires human intervention
  - Few tools provide native support for sharing
  - CERT does provide tools to extract, filter, and sanitize information
- What guarantees do I have for my data?
  - Once data is handed over, all guarantees are founded on trust – no practical technological solution
  - Accreditation of processes, technology, and facilities

(1) I am reporting data to CERT (cont'd)

- "My information is sensitive, I want to protect:"
  - Information revealed in packet payloads
    - Contents of email, clear-text authentication
  - Internal topology of the network
    - Size and the purpose of individual hosts
  - Laxness or lapses in security
    - Outbound attacks
    - Usage of certain services (e.g., P2P)
    - Indications of vulnerabilities
- Often raw data is not possible; only share summaries

(2) CERT is receiving my information

- Willingness to share does not always mean utility for the CERT
  - Impossible to mechanically parse free-form text reports
  - Organizational or obscure data formats (i.e., vendor X with tool Y version Z.zzz.z)
- Employ standard data use policies
  - For all automated data sharing, a formal MOU governs the exchange
  - Public, default data disclosure policy for all self-reported data
- Public knowledge of honey-pot addresses is problematic

(2) CERT is receiving my information

- Community specific constraints
  - Academic community
    - Cannot tie data back to students
      - IP address resolved to host names which contained a student's name
  - Federal community
    - Cannot collect Personally Identifiable Information (PII)
      - Only present in the payload
  - Medical community
    - HIPPA prevents PII collection
      - Only present in the payload

(3) CERT is disseminating information

- Does not provide attribution
  - Sometimes obfuscates results to do peer comparison
- Coordinating pre-release information requires a substantial volume of encrypted email
  - Dedicated tool (srmail) to handle encryption/decryption among various standards (e.g., gpg, pgp, s/mime)
- How to control the use of data after it is made available?
  - Contractors and federal government “rights to use” on pre-release information
  - Data leak through a 3rd party
  - Reaction of some open-source vs. COTS vendors to a vulnerability

(3) CERT is disseminating information

- Who is the right audience?
  - Traditionally, advisories were for system administrators – now have summaries for management
  - How to reach home users?

(4) I am receiving CERT information

- Optimal format for receiving information:
  - Semantics: push vs. pull
  - Transport protocol: email, web, etc.
  - Machine parsable vs. human readable
- How timely is the information?
  - Incomplete information, but early notification
    - Incremental updates
  - Complete information, but late notification

Observations in Data Sharing

- Datasets based on more sites is not always better – a representative sample is key
  - *Defining representative is hard*
- The community needs to develop and adopt standards formats and protocols to exchange analytical results
  - *Adoption by the vendor community will be required*
- Centralization is not desirable; expertise to analyze data is rarely found in one place – build a community of analysts
  - *The politics of data sharing make this hard*