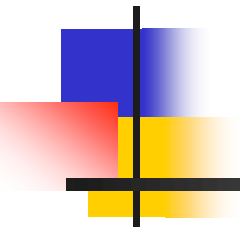

Administrative Security: Procedural Controls

Professor Stephen S. Yau

Contents

- Information Storage
- Passwords
- Auditing
  - Auditing systems
  - Audit process
- Classification Schemes

Information Storage

- Various storage media:
  - Written documents and images on papers or negatives
  - Voice or video records on tapes
  - Digital format information on
    - Floppy disc
    - Zip disk
    - Flash memory (e.g. USB key drive, CF card, SD card)
    - Hard drive
    - CD - (R, RW)
    - DVD (+R, -R, -RW, +RW)
    - Tape

Information Storage Management

- ***External marking*** of media
- ***Destruction*** of media
- ***Sanitization*** of media
- ***Transportation*** of media
- ***Emergency destruction***

Password Attack Methods

- **Password Guessing**
  - Most common attack
  - Attacker knows a login, such as from email/web page
  - Attempts to guess password
  - Some categories of passwords that are easy to guess:
    - Based on account names
    - Based on user names
    - Based on computer names
    - Dictionary words
    - Reversed dictionary words
    - Dictionary words with some or all letters capitalized

Password Attack Methods (cont.)

- **Password Capture**
  - Watching over shoulder as password is entered
  - Using Trojan horse (virus-infected) program
- **Attacks on password entry due to faulty system design**
  - Eavesdropping: The password characters are plaintext
  - The login screen is faked
  - Unlimited password retries
- **Storage attack**
  - Analyze un-encrypted audit trails
  - Password is stored as plain text

Auditing

- ***Logging*** : ***Recording*** of events or statistics to provide information about ***system use and performance***
- ***Auditing*** : ***Analysis*** of log records to present information about the system in a clear and understandable manner

Auditing (cont.)

- ***What*** happened?
- ***When*** did it happen?
- ***Who*** did it?
- What went ***wrong***?
- Who had ***access*** to key information?

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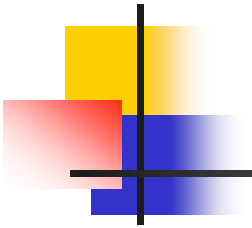


Auditing Systems

- An auditing system consists of three components:
  - ***Logger:*** collects data
  - ***Analyzer:*** analyzes the collected data
  - ***Notifier:*** reports the results of analysis

Auditing Systems (cont.)

- ***Logger:***
  - The type and quantity of information decided by system or program configuration parameters
  - Information may be recorded in binary or human-readable form or transmit directly to an analysis system

Auditing Systems (cont.)

- ***Logger:***
  - Examples of ***auditable events***:
    - Login
    - Logoff
    - Operating system changes
    - User-invoked operating system commands
    - User-invoked applications
    - Read of data
    - Creation of objects
    - Network events

Auditing Systems (cont.)

- ***Analyzer:***
  - Takes a log as input and analyzes it.
  - Results of analysis may lead to changes in the data being recorded, or detection of some events or problems, or both.
  - Example:
    - Used by an intrusion detection system to detect attacks by analyzing log records

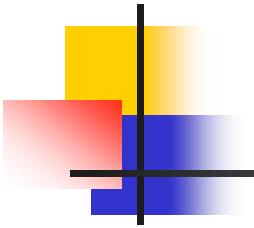
Auditing Systems (cont.)

- ***Notifier:***
  - Informs the analyst and other entities of the results of the audit.
  - Actions may be taken in response to these results.
  - Example:
    - A login system, in which three consecutive failed login attempts disable the user's account. When a user's failed login attempts 3 times, the audit system will invoke the notifier, which will report the problem to administrator and disable the account.

Audit Process

- ***Audit Team***
  - Federal or State Regulators - Certified accountants, CISA from Federal OTS, Dept. of Justice, etc.
  - Corporate Internal Auditors - Certificated accountants, CISA.
  - Corporate Security Staff - Security managers, CISSP, CISM.
  - IT Staff and needed expertise varies
- ***CISA*** - Certified Information Systems Auditor
- ***OTS*** – Office of Thrift Supervision
- ***CISM*** - Certified Information Systems Manager
- ***CISSP*** – Certified Information Systems Security Professional

**www.isaca.org* *(Information Systems Audit and Control Organization)*



Audit Process

1. Planning Phase
2. Testing Phase
3. Reporting Phase

Planning Phase

- Entry Meeting
- Define Scope
- Learn Controls
- Historical Incidents
- Past Audits
- Site Survey
- Review Current IA Policies
- Questionnaires
- Define Objectives
- Develop Audit Plan / Checklist

Testing Phase

- Evaluate Audit Plan
  - What data will be collected?
  - How/when it will be collected?
  - Site employees' involvement?
  - Other relevant questions?
- Data Collection
  - Based on scope/objectives
- Types of Data
  - Activities involving physical security
  - Interview staff
  - Vulnerability assessments
  - Access control assessments

Reporting Phase

- Exit Meeting - ***Short Report***
  - Immediate problems
  - Question & answer for site managers
  - Preliminary findings
  - Does NOT give in-depth information
- ***Long Report*** After Going Through Data
  - Objectives/scope
  - How data was collected
  - Summary of problems
  - In-depth description of problems
  - Glossary of terms
  - References
- Any computer misuse or abuse should be reported and law enforcement may be involved if needed

Classification Schemes

- Early 1980s: Confidentiality of classified information on computers with multiple users (time sharing systems)
- Mid 80s to mid 90s:
  - **Orange Book** (or TCSEC): standard reference for computer security for DoD
  - **Red Book**: covering Trusted Network Interpretation (TNI) of the Orange Book
  - Rainbow Series* is outdated and superseded by Common Criteria Evaluation and Validation Scheme (CCEVS)**

http://www.iwar.org.uk/comsec/resources/standards/rainbow/rainbow.html

*** http://www.niap-ccevs.org/cc-scheme*** NIAP CCEVS

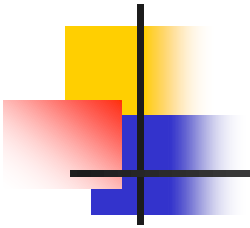
Classification Scheme (Cont.)

- Data classification based on need for confidentiality
- Based on potential damage, if compromised, and defines treatment rules
  - ***Top secret***: Publicly disclosed would compromise national security
  - S***ecret***: ….would cause serious damage to national security
  - ***Confidential***: …. would damage national security
  - ***Unclassified***

Classification Scheme (Cont.)

- Unclassified includes
  - ***Sensitive But Unclassified (SBU)***
  - ***Unclassified – Law Enforcement Sensitive (U//LES)***
  - ***For Official Use Only (FOUO).*** Not subject to release under the Freedom of Information Act (FOIA). May include company proprietary information
  - …..

***http://en.wikipedia.org/wiki/Security_classification**



Classified Information Management

- Accountability for classified data
- Declassification/Downgrade
- Sanitization/Purging
- Destruction

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