Management of Strong Access Control

Edward A. Schneider
eschneider@ida.org
26 September 2000

Overview

• Information Families
• Flexible Policies
• Management issues
Information Families

Collection of data objects
- Subjects that can access it
- Security policy

Strong Access Control

- Usually discretionary within family
  - Accesses defined by object types
  - No walls between subjects

- Walls between families
  - Includes network communications
  - VMs and VPNs

- System-controlled transfers
  - Data
  - Subject creation
Mail Order Firm

Flexibility

- Add and delete families
  - Transactions
  - Form coalition / virtual organization
  - New application with unique interactions

- Change permitted flows
  - Response to a threat
  - Resource failures
**Policy**

{ Permissions, Prohibitions, Obligations }

- Information Flow from \( F \) to \( F' \)
  - Requires a subject \( S \) in both \( F, F' \)
  - \( F \text{policy} \) permits \( S \) export_\( F' \)
  - \( F' \text{policy} \) permits \( S \) import_\( F \)

- B agent in Billing and Transaction families

**Policy as Data**

- Security Management Information Base (SMIB)
- Separate from enforcement mechanisms
- Policy contained in some information families
  - Protected according to access control policy of those families
SMIBs

- SMIB may define policy for its own family
- Transfers governed by SMIBs at both ends

Information Flows

- Implicit flow from SMIB to family
- Policies such as Chinese Wall require flow from family to SMIB
  - Policy updated by accesses
- New family may circumvent prohibition

© 2000 Edward A. Schneider. Permission to make digital or hard copies of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice.
Strength of Mechanism

- Access Control depends on
  - Identification
  - Cryptography
  - Audit
  - Program correctness

- Families may require a strength for each of these from the platforms which host them