Wiki Platforms in High Assurance Environments: Beyond Intellipedia

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Wikimania 2010

The University of Tulsa
Institute for Information Security

Overview

- Background
  - Key Words
  - Tricky Phrases
- Security Models
  - General
  - In use in a Wiki
- Government vs. Corporate
  - What the GOV does
  - What corporations need
- SecureWiki Project

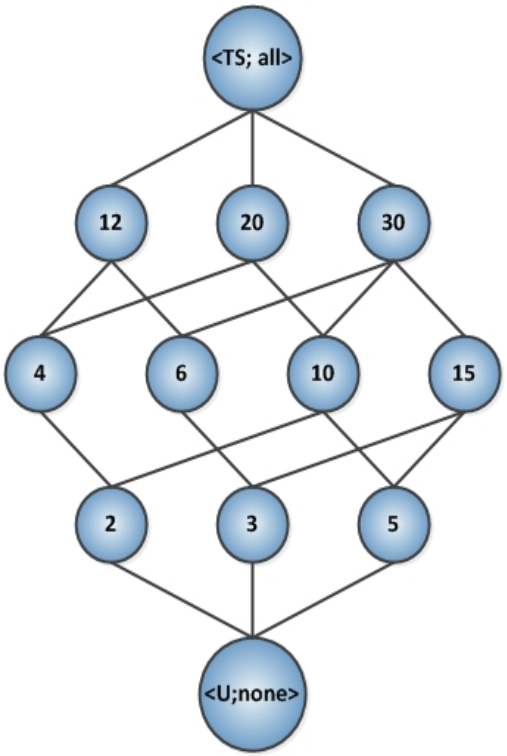
Integrity vs. Confidentiality

- Confidentiality:
  - Concealment of information or resources
  - Prevent unauthorized disclosure
  - Accessible by those that are cleared
- Integrity:
  - Prevent unauthorized modification
  - Modification includes
    - Writing
    - Deleting
    - Creating
    - Change status

"You can't retire. You know too much. You might talk."

Multilevel Security (MLS)

- Hierarchically organized security classification scheme
  - Common in government and military
    - Sensitivity Levels (Unclassified to Top Secret)
    - Compartmentalized for further segregation
    - Requires access and need to know
  - Can be viewed as a lattice structure
    - Organized based on dominance relationship
    - Height is clearance level
    - Breadth is compartment



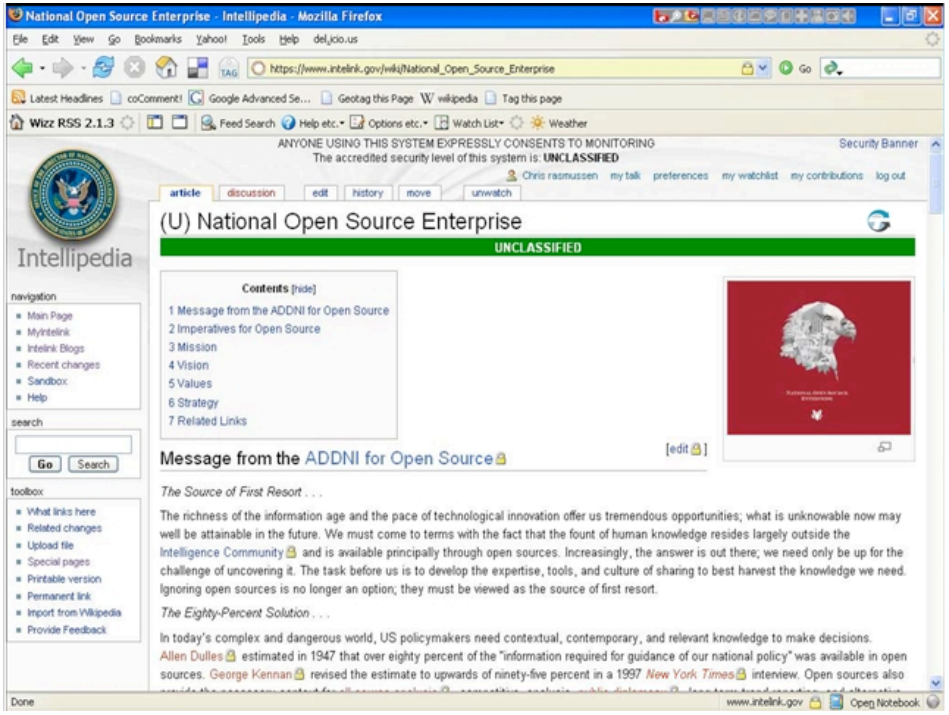
Security Model Overview

- The scheme for specifying and enforcing security policies

- Bell—La Padula Security Model
  - MLS
  - Formal mathematical model with rigid structure
  - No Read-Up, No Write-Down
  - No method for redaction/reduction of classification
- Biba Integrity Model
  - Formal mathematical model of state transition
  - No Read-Down, No Write-Up
- Many others

Implementation in Wiki

- Intellipedia
  - Information stored in separate data stores
  - Access via different networks
  - Information is kept visually and logically separate at all times
  - Follows MLS / Bell—La Padula models



Implementation in Wiki

- Tearline Wiki
  - Information stored in separate data stores
  - Access via different networks
  - Information is kept visually separated via “tear lines”
  - Follows MLS / Bell—La Padula model

How is this type of security applicable outside of the government?

Why Security in Corportate Wiki

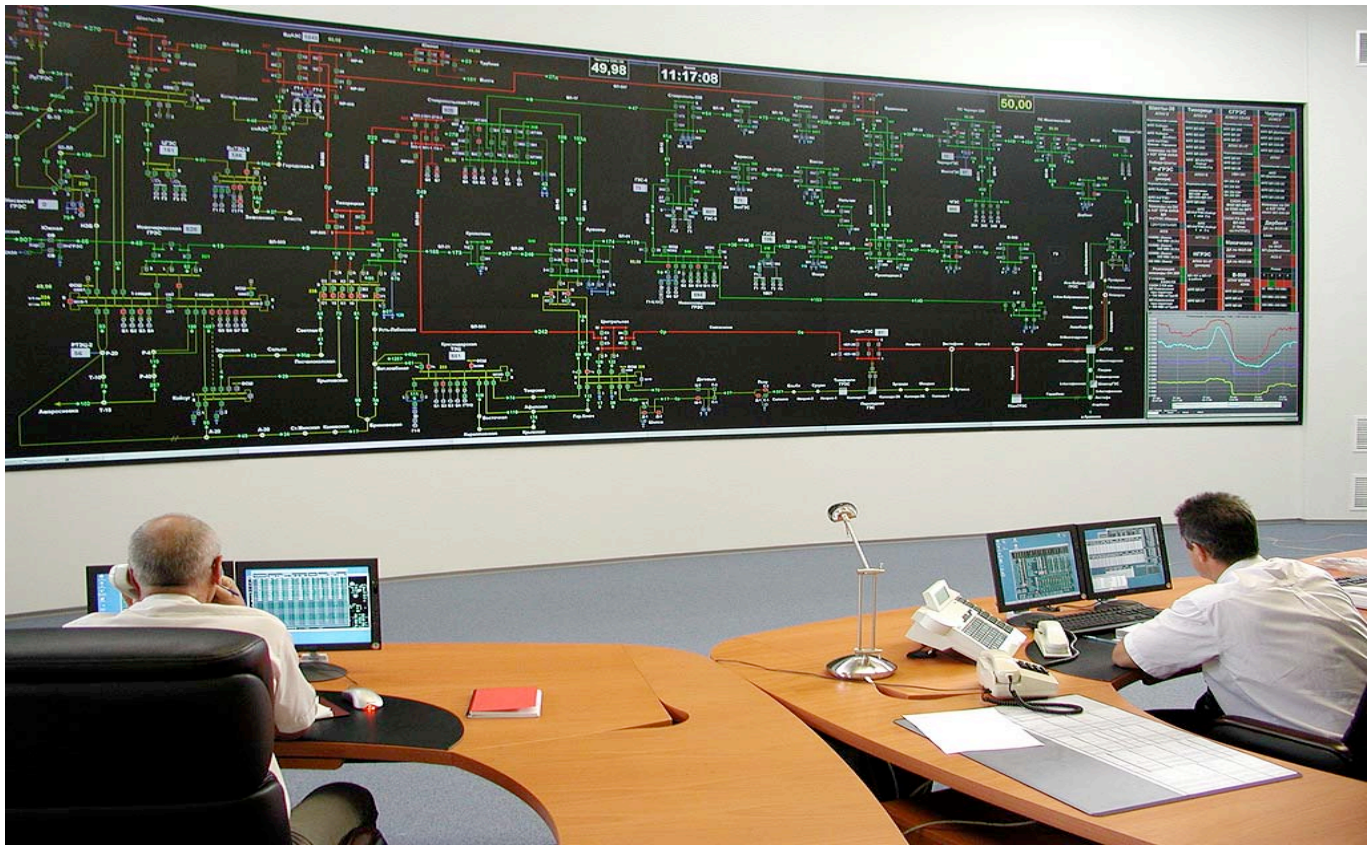
- 90% of companies agreed that “Collaboration tools that cross company boundaries are essential to run our business.”
- 96% agreed that “Data security is the most important security priority for our company.”
- Secrets compromise two—thirds of the value of the firms’ information portfolio

Corporate Needs

- Intellectual Property
- User and Customer data
- Financial Data
- Production capabilities

http://bostonherald.com/blogs/entertainment/the_assistant/wp-content/uploads/2010/01/money.jpg

Sharing in Critical Infrastructure



http://www.barco.com/projection_systems/images/RussianPowerGrid_l.jpg

How a Wiki can help

- Reduce number of copies
- Reduction in workload and strain associated with keeping all working copies up-to-date
- Enhance usability and information sharing
- Improve efficiency
- Improve communications

Usability/user experience

- Classic security problem:
  - If too difficult users will find a work around or stop using it
- Key goal is to implement the most “wiki”-like environment while ensuring proper security for the environment
  - Familiar environment
- The overall design of user interface and experience of a secure wiki environment is a paramount issue
  - Implement easiest edit method of page

SecureWiki

- Security Enhanced Wiki
  - Under development at the University of Tulsa
  - Expected better granularity than other environments
  - More cohesive user interface
- Uses a modified MLS security model
  - Permitting redaction and declassification
  - Heavily dependent upon cryptography
- Designed to be an Open Source implementation
- Primarily focused on:
  - Corporate Organizations
  - Critical Infrastructure (Electric Power Grid, Water Works, etc)
  - Health Care Industry

Challenges and Possibilities

- Implementation
- Validation of security controls
- Ownership of shared data
- Segregation of data
- Organizational acceptance

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Resources

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3 Pfleeger, Charles and Shari Pfleeger. 2007. *Security in Computing* 4th ed. Boston: Prentice Hall.

4 Information Security: Integrity. http://en.wikipedia.org/wiki/Information_security#Integrity (accessed 24 June 2010).

5 Multilevel Security. http://en.wikipedia.org/wiki/Multilevel_security (accessed 24 June 2010).

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7 Forrester Consulting. 2010. “The Value of Corporate Secrets: How Compliance and Collaboration Affect Enterprise Perceptions of Risk”, Technical Report. Forrester Research Inc.

http://www.rsa.com/products/DLP/ar/10844_5415_The_Value_of_Corporate_Secrets.pdf

Questions?

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