

Applications of Logic in Security

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Overview

- Elements of logical security
- Generic security logic
- Examples of security flaws
 - Yahoo!
 - YouTube censoring
 - Facebook privacy
 - Brokerage firms
 - Password protection
- Sources
- Questions/comments

Elements of Logical Security

- User IDs
- Authentication
 - Token
 - Password
 - Two-way
- Biometrics
 - Fingerprints
 - Hand measurements
 - Voice patterns



Generic Security Logic

$\forall x (\text{Password}(\text{entered}) \neq \text{Password}(x) \rightarrow \text{FAIL})$

$\forall y (\exists z (\text{Restricted}(z) \wedge \neg \text{Access}(y)) \rightarrow \text{FAIL})$

$\forall u (\text{SecurID}(u, t) \neq (\text{SecurID}(\text{comp}, t) \vee$
 $\text{SecurID}(\text{comp}, t - 1) \dots) \rightarrow \text{FAIL})$

Yahoo!

- Users send \$30 for future spending with advertising program
- Yahoo! will give \$50 free SEM advertising
- Logic *should* be: “If money is deposited then give a credit, if not then fail.”
 - User earns credit even if the deposit is invalid

YouTube censoring

- Some videos were off-limits for registered users under 18 years of age
- If the video is embedded in another website, there is no age restriction for viewers

Facebook Privacy

- Users can specify who can/cannot view their page
- Unauthorized viewers can simply put the restricted user's serial number in the URL and view content from that user
 - Only with Firefox

Online brokerage firms

- One user was able to open 58,000 accounts
- Linked each new account to an existing bank account
 - E-Trade and Schwab sent “micro-deposits” to confirm the banking account
- Over \$50,000 was accumulated by one user

Password Protection (or lack thereof)

- Users are prompted to enter their password before confirming an order and charging the credit card on file
- However, the password can be changed without knowing the old password

Sources

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Questions and Delta-Analysis