Fostering the usability of information security solutions

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Overview

Introduction
End-user survey
Improving usability
Conclusions
Introduction

Users often wish to protect their systems and data

Related features can be found in:
- Security-specific tools (e.g. AV, firewall)
- Security-related options within other software (e.g. the OS and application programs)

However, usability is sometimes a problem issue
- Security options need to be understood by those who need to use them

Security ought to be . . .

Understandable
- Users must be able to determine and select the protection they require
- The technology should not make unrealistic assumptions about the user’s prior knowledge

Visible
- Users must be able to find the functionality
- Users ought to be able to determine whether protection is being applied and to what level
- Need to maintain balance - it should not be so visible that it becomes intrusive
Prior works

Notable works include:
- Whitten and Tygar (1999) – Assessed usability and friendliness of the PGP utility
- Johnston et al (2003) – Assessed the Internet Connection Firewall in Windows XP

Studies targeted security-oriented tools
- Security features also exist within more general end-user applications

Assessing end-user awareness
Security usability survey

- Online survey of over 325 users conducted during July and August 2005
- Considered security options in standard end-user applications:
  - Internet Explorer
  - Word
  - Outlook Express
- Assessed user interpretations and/or understanding of security-related interfaces

Survey Respondents

- Almost 50-50 split between male and female
- Over 80% in the 17-29 age group
- Over 80% have university-level education
- 99% are regularly use a computer at home and/or at work
- Almost 90% rate themselves as intermediate or advanced users
Basic security in IE

- IE’s default security setting of ‘Medium’
- Ostensibly simple ‘security level’ slider
- A third of users do not understand what the description means
IE ‘Custom’ Security Settings

- Only 40% of respondents claimed to understand these options
- A third had not heard of ActiveX
  - and only half of those that had knew what it is

What happened to the slider?

Having gone into the Custom settings, you no longer get any indication of your level of protection (even if you don’t change anything!)
Too much security!

If users are concerned about protection, their natural reaction may be to set security to ‘High’

BUT

This is the result of going to the Hotmail site with Security set to ‘High’

The browser provides no indication that the security setting is preventing the page from loading properly

Unfriendly dialogs?

Only 40% of respondents would feel able to make a decision
Security in Microsoft Word

Password Protection

- A third of users do not understand the difference between these password options

- More than a third misunderstand this dialog
  - A quarter believe the document cannot be opened without a password
Encrypting a document

- 73% of respondents would not know how to choose an appropriate option
- 76% would not know how to choose a key length

Improving usability
HCI-S Guidelines

1. Visible system state and security functions
2. Security should be easily used
3. Suitable for advanced as well as first time users
4. Avoid heavy use of technical vocabulary or advanced terms
5. Handle errors appropriately

6. Allow customization without risk to be trapped
7. Easy to setup security settings
8. Suitable Help and documentation for the available security
9. Make the user feel protected
10. Security should not reduce performance

Interface improvement example

'Advanced' tend to scare users, and especially beginners

Grouping the security settings in an advanced tab may result in users never accessing them

New Interface makes the security options more prominent when the user scans the list
Existing good practice

- Configurable from a single window
- Clearly visible security status
- Easily accessible explanations and help

Conclusions
Conclusions

- Security is often easier said than done
- Making related options available is not sufficient
  - Users have clear problems understanding security options
  - If they cannot use the features, they will remain unprotected
- Need good default settings
  - But users still need the option to change things
- Need to cater for users at all levels

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