Helping Your Users by Spying On Them

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Overview

- With luck, presentation will be combination of lecture and demo
  - Focus is on the process as much as the results

- Flow
  - Part-1: Awareness
  - Part-2: Investigation
  - Part-3: Findings
  - Part-4: Opportunities

Part-1: Awareness

- Ref-1: Hacking Exposed: Computer Forensics
  - – Book: Hacking Exposed: Computer Forensics Secrets & Solutions, 2005
    - Relatively recent publication
  - – Page 136
    - "When a user executes a program or accesses certain types of files in Windows XP, a built-in Windows function documents his or her actions."
    - "User Assist is a new feature in Windows XP that is not well documented or well understood by the public."
    - "It is like a built-in spyware tool that cannot be disabled..."

Part-1: Awareness cont'd

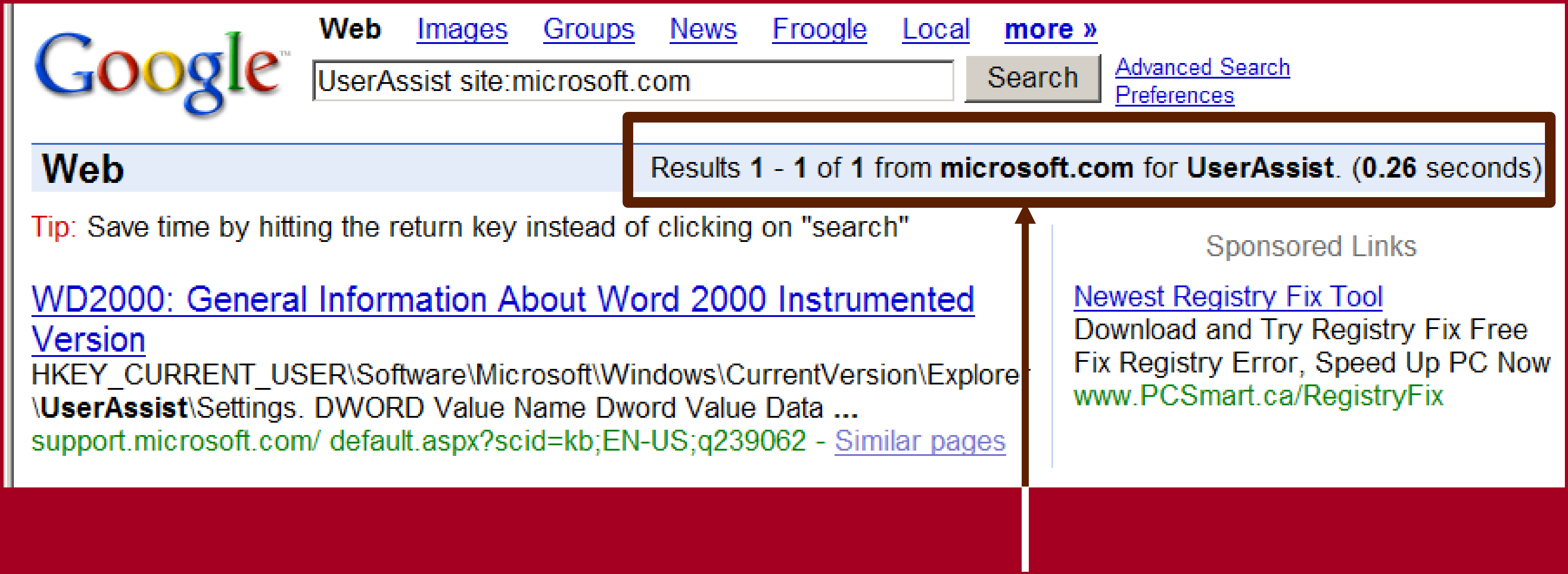
- Ref-1, page 136 cont'd
  - "It captures the actions of a user until someone or something removes the entries from the registry."
  - "User Assist entries are encrypted, but... they are encrypted with ROT 13!"
  - User Assist entries stored in registry:
    HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\UserAssist

Part-1: Awareness cont'd

- This is enough to motivate some checks...
  - Demo-1
    - Target: HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\UserAssist...
    - Tool: Regedit
  - Demo-2
    - Target: Encrypted entries
    - Tool: MS Excel
  - Demo-3
    - Target: Effect of cleaning IE and Explorer caches
    - Tools: IE, Taskbar, Regedit

Part-2: Investigation

- What does Microsoft.com say about this?
  - Google search: UserAssist site:microsoft.com
    - Just search for results within microsoft.com



UserAssist site:microsoft.com

Results **1** - **1** of **1** from **microsoft.com** for **UserAssist**. (**0.26** seconds)

Tip: Save time by hitting the return key instead of clicking on "search"

WD2000: General Information About Word 2000 Instrumented Version
HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\UserAssist\Settings. DWORD Value Name Dword Value Data ...
support.microsoft.com/ default.aspx?scid=kb;EN-US;q239062 - Similar pages

Newest Registry Fix Tool
Download and Try Registry Fix Free
Fix Registry Error, Speed Up PC Now
www.PCSmart.ca/RegistryFix

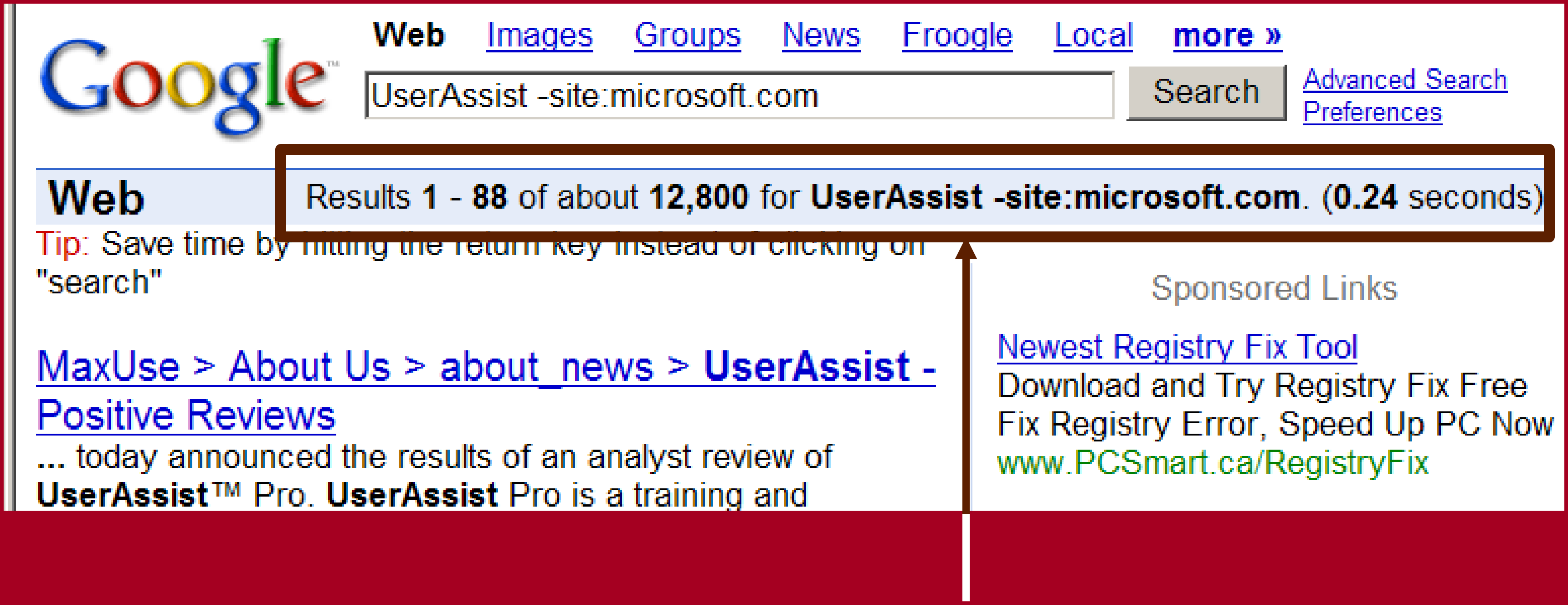
One result... for special version of MS Word 2000

Part-2: Investigation cont'd

- What does Microsoft say cont'd
  - MS Word 2000 Instrumented Version
    - Research program that helps Microsoft gather information about how certain functions in Word and Office are used
    - Information stored as files with *.rsh extensions
    - Created registry entries include:
      - HKEY_CURRENT_USER\Software\Microsoft \Windows\CurrentVersion\Explorer \UserAssist\Settings
  - Not exactly on-target since
    - Different registry keys... no files with .rsh extensions
    - <Check to be sure>

Part-2: Investigation cont'd

- What about non-MS sources?
  - Google search: UserAssist -site:microsoft.com
    - Any domain other than microsoft.com



UserAssist -site:microsoft.com

Web Results **1** - **88** of about **12,800** for **UserAssist -site:microsoft.com**. (**0.24** seconds)

Tip: Save time by hitting the return key instead of clicking on "search"

MaxUse > About Us > about_news > **UserAssist** - Positive Reviews

... today announced the results of an analyst review of **UserAssist**™ Pro. **UserAssist** Pro is a training and

Sponsored Links

Newest Registry Fix Tool

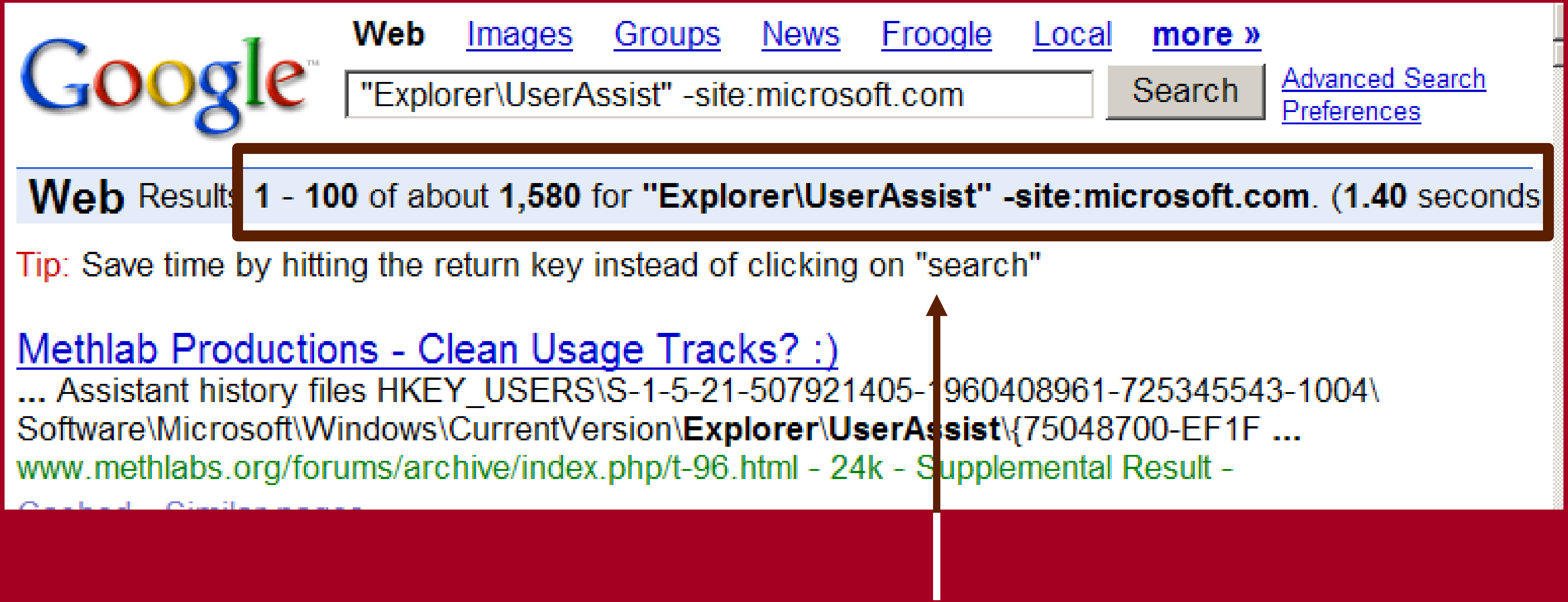
Download and Try Registry Fix Free Fix Registry Error, Speed Up PC Now

www.PCSmart.ca/RegistryFix

12,800 Results... way, way more than I hoped for

Part-2: Investigation cont'd

- Non-MS sources cont'd
  - More restricted Google search: Explorer\UserAssist -site:microsoft.com



"Explorer\UserAssist" -site:microsoft.com

Web Results **1** - **100** of about **1,580** for **"Explorer\UserAssist" -site:microsoft.com**. (**1.40** seconds

Tip: Save time by hitting the return key instead of clicking on "search"

Methlab Productions - Clean Usage Tracks? :)
... Assistant history files HKEY_USERS\S-1-5-21-507921405-1960408961-725345543-1004\ Software\Microsoft\Windows\CurrentVersion\Explorer\UserAssist\{75048700-EF1F ...
www.methlabs.org/forums/archive/index.php/t-96.html - 24k - Supplemental Result -

1,580 Results... getting closer

Part-2: Investigation cont'd

- Ref-2: explorer_spy.txt (updated)
  - Meta
    - Title: Yet Another Method Windows Uses to Log Your Computer Activity
    - Author: Jeremy Bryan Smith aka Helamonster
    - Source for updated (2003-08-18) version: http://www.utdallas.edu/~jbs024000/articles/explorer_spy.html
    - Excerpts reformatted and reworded for brevity

Part-2: Investigation cont'd

- Ref-2 cont'd
  - Poking around registry found these suspicious keys:
    - HKCU\Software\Microsoft\Windows\CurrentVersion\Explorer\UserAssist\{5E6AB780-7743-11CF-A12B-00AA004AE837}\Count
    - HKCU\Software\Microsoft\Windows\CurrentVersion\Explorer\UserAssist\{75048700-EF1F-11D0-9888-006097DEACF9}\Count
  - Entries encrypted with ROT-13
  - Decrypted entries refer to URLs, programs, and so forth

Part-2: Investigation cont'd

- Ref-2 cont'd
  - Both count keys had entries corresponding to
    - Files not accessed since Windows first installed
    - Files and URLs not accessed for years
  - Information always collected, never deleted
    - One key had 18,497 entries
    - Other key had 394 entries
    - Over time, contributes to
      - Registry bloat
      - Registry fragmentation
      - Windows slow down

Part-2: Investigation cont'd

- Ref-2 cont'd
  - First hypothesis: Computer infected with ***Malware***
    - Program updating these keys: EXPLORER.EXE
    - Unmodified from Windows 2000 SP1 distribution
  - Second hypothesis: What looks like malware is actually an undocumented ***feature*** in MS Windows
  - Third hypothesis: You can make Windows faster and more respectful of your privacy if you simply "delete those dumb keys at every logon/logoff"

Part-2: Investigation cont'd

- Ref-3: Vic Ferri, WinTips and Tricks
  - Meta
    - Title: The Count Keys in the Windows Registry: What They Do, How To Understand Them, and How To Remove Them
    - Author: Vic Ferri, WinTips and Tricks
    - Source: http://personal-computer-tutor.com/abc3/v29/vic29.htm
    - Excerpts reformatted and reworded for brevity

Part-2: Investigation cont'd

- Ref-3 cont'd
  - Count keys lesser known, rather mysterious registry keys
  - Used to log some online and offline activities
  - Leads one to believe that these are "spyware" keys but:
    - These keys are also used by legitimate sources - both online and offline
    - Online, many sites you consider trustworthy may add info to these keys when you visit them
      - Example: Google creates/updates entries when you visit their site(s)

Part-2: Investigation cont'd

- Ref-3 cont'd
  - Choice: Delete these keys... recreated at next login
  - Choice: Stop the logging
    - Not documented or supported by Microsoft, so
      - Your mileage may vary
      - May leave system in unusable state (right away or after next Windows Update)
    - Method
      - Add a new key to UserAssist: 'Settings'
      - Add new value to 'Settings': DWORD NoLog 1
Reboot (and pray)

Part-2: Investigation cont'd

- Ref-3 cont'd
  - Choice: Stop the encryption
    - Not documented or supported by Microsoft, so
      - Your mileage may vary
      - May leave system in unusable state (right away; or after next Windows Update; or after next full moon)
    - Method
      - Add a new key to UserAssist: 'Settings'
      - Add new value to 'Settings': DWORD NoEncrypt 1
      - Reboot; Pray it works
      - Old entries still encrypted, but new entries should be unencrypted

Part-2: Investigation cont'd

- How to determine which user events recorded in these keys
  - Option-1
    - View registry with regedit
    - Perform event
    - View registry with regedit, look for changes
    - Real ugly

Part-2: Investigation cont'd

- How to determine cont'd
  - Option-2
    - Export registry tree with regedit
    - Perform event(s)
    - Export registry tree
    - Compare
    - Still ugly
  - Option-3
    - Use (free) regmon tool to detect changes in real-time
      - Source: www.sysinternals.com

Part-2: Investigation cont'd

- Determine which events recorded
  - Demo-4
    - Target: Registry changes
    - Tool: Regmon, no filters
  - Demo-5
    - Target: Selected registry changes
    - Tool: Regmon with filters
  - Demo-6
    - Target: Decrypt registry changes
    - Tools
      - Regmon, filtered, exported logs
      - Excel to decrypt line by line

Part-2: Investigation cont'd

- Determine which events recorded cont'd
  - Demo-7
    - Target: Viewing impact of series of events
    - Tools:
      - Regmon, filtered, exported logs
      - Excel to trim
      - VBS Script to decrypt sequence
  - Demo-8
    - Target: Viewing impact of series of events
    - Tools:
      - Regedit to delete; add NoEncrypt; Reboot
      - Regmon, filtered, view

Part-2: Investigation cont'd

- Determine which events recorded cont'd
  - Demo-9
    - Target: Same as Demo-8, focusing on events, not methods
      - Windows explorer: buttons; document shortcuts; program shortcuts
      - Internet explorer: favorites (name vs url); new favorites; typed urls; etc.
      - Firefox
      - Command line
      - Etc.

Part-3: Findings

- Is this spyware?
  - Depends on your point of view
    - Ref: Spyware definitions from Bill Hayes' presentation
  - Yes
    - Information about user activities is collected without their knowledge or consent
    - Collected information includes <selected> web site behavior
    - Part of a for-profit product managed by a business venture
    - Collected information is probably intended for market research, but it can also be used for industrial or national espionage

Part-3: Findings

- Is this spyware cont'd
  - No
    - No reports of this collected information being sent to an outside source without users' knowledge
    - No reports of this collected information containing user PII information considered real private (e.g., authentication credentials, SSN, etc.)
    - Doesn't change how the computer interacts with the user
      - Unless it slows down... presumably unintentional

Part-3: Findings

- Is this spyware cont'd
  - Depends... What if Microsoft
    - Discontinued collecting information related to web sites?
    - Changed to stronger encryption?
    - Sent information about how you use your computer and network to Microsoft servers:
      - To help them design future operating systems, better suited to your activities?
        - » *Consistent with description for MS Word 2000 IV*
      - For resale to other organizations?
        - » Example: A user with extensive bookmarks related to cruises would probably be a high-value "mark" for cruise lines seeking potential customers

Part-3: Findings

- Are web sites like google updating local registry?
- Is the monitoring comprehensive?
- Is this new, or exclusive to, Windows XP?

Part-4: Opportunities

- Augment the capabilities of your favorite applications and/or operating systems
  - Extend the concept of personalized menus to include buttons, IE favorites, desktop items, etc..
  - Collect the information from multiple clients into a single DB for study, future improvements
- Augment the capabilities of your favorite spyware package
  - Collect information for sharper user profiles, resale

Part-4: Opportunities cont'd

- Use in an enterprise, with remote registry service, to monitor your employees
  - Detect and record off-task activities
  - No need to install obnoxious client-side software... can do it all server-side

Note: This concept could be extended to remote monitoring of virtual enterprises where member clients unwittingly self-nominate themselves by connecting to the network with insufficient safeguards

Part-4: Opportunities cont'd

- Protect yourself, your organization from unauthorized collection, disclosure
  - Delete the keys
    - Every logoff
    - After especially interesting series of events
  - Disable logging via 'NoInstrumentation' described in multiple ***Microsoft*** KB articles, including 292504
    - With Group Policy Editor (strongly preferred)
      - User Configuration \ Administrative Templates \ Start Menu and Taskbar

Part-4: Opportunities cont'd

- Protecting yourself cont'd
  - Disable logging via 'NoInstrumentation' cont'd
    - With regedit
      - Key: 'HKCU\Software\Microsoft\Windows \CurrentVersion\Policies\Explorer
      - NoInstrumentation DWORD
        - » 0 (or missing): Enable user tracking
        - » 1: Disable user tracking... disables customized menus, etc.
  - Disable logging via 'NoLog' described by Ref-3
    - Risk unknown

Finished

- Summary
  - First reports very helpful, but not always complete
  - Simple free tools can be used to determine what's happening
  - UserAssist entries have the potential to support multiple opportunities, some of which you may want to prevent
- Questions?