Sticky Keys to the Kingdom

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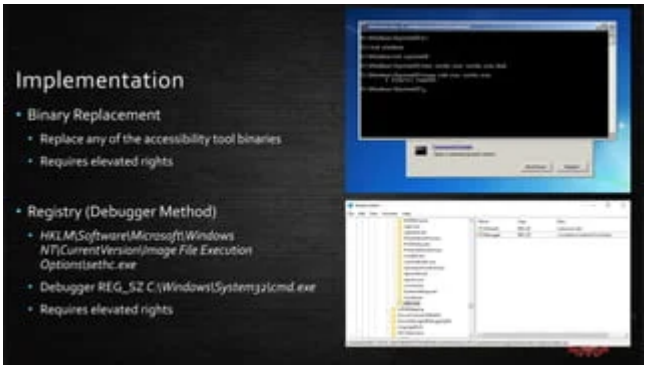
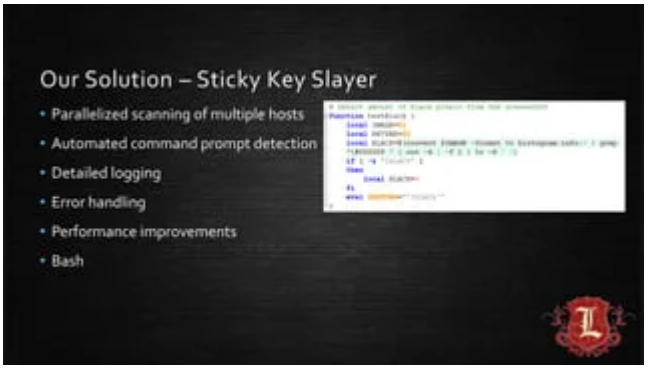



Windows Accessibility Tools
Binary
Description
How to access
Shift 5 times
Windows Key + U
Windows Key + Ctrl + O
Windows Key + Enter
Windows Key + P

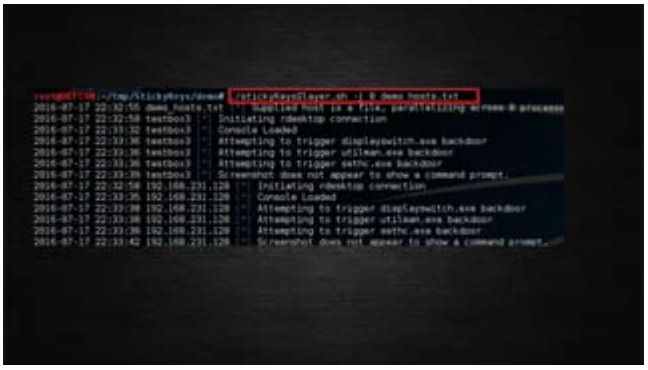

Limitations
Elevated access or offline system required
Replacing binary must be Digitally Signed
Replacing binary must exist in \System32\
Replacing binary must exist in Windows "Protected File" list
You can't use any old Binary, but you can cmd.exe /c file.bat

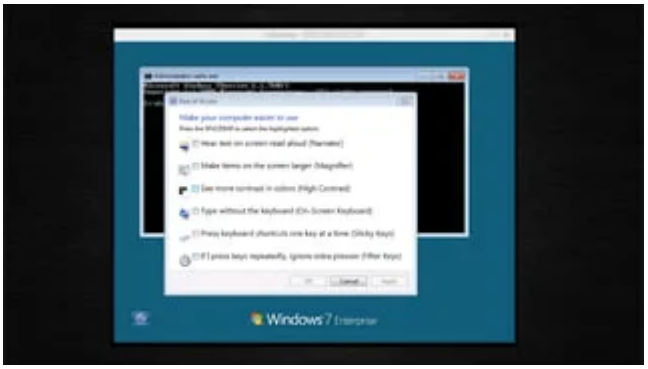

Background
While working with an Incident Response Team:
Uncovered dozens of vulnerable hosts via file checks
Identification was done from the filesystem side
Missed the debugger method
Missed any unmanaged boxes
Needed a network-based scanner


Background
We wanted to write out own network-based tool
Started down the JavaRDP/Python Path
Ran across @ztgrace's PoC script, Sticky Keys Hunter
It worked, and was a great starting point
Similar to "Peeping Tom"
Opens a Remote Desktop connection
Sends keyboard presses
Saves screenshot to a file
To do list including automatic command prompt detection and multi-threading


Our Solution – Sticky Key Slayer
• Parallelized scanning of multiple hosts
• Automated command prompt detection
• Detailed logging
• Error handling
• Performance improvements
• Bash

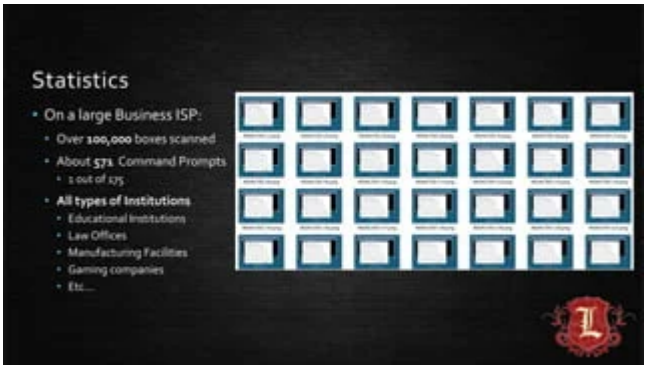

DEMO
VIDEO:
HTTPS://WWW.YOUTUBE.COM/WATCH?V=JY4HGGA1FYI

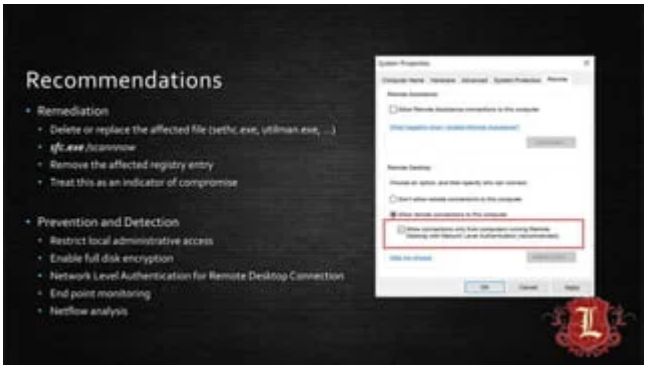


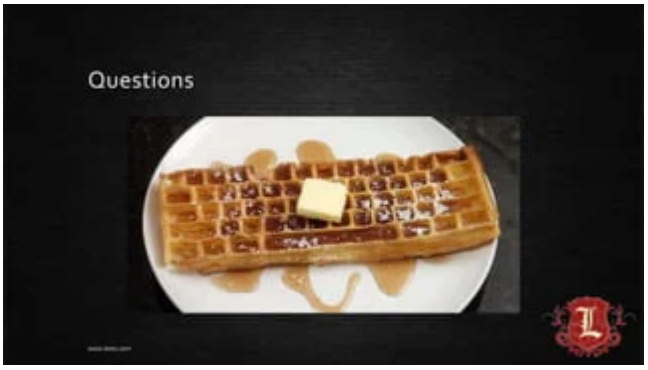

Windows 7 Enterprise


Tools Usage
./stickyKeysSlayer.sh -v -j 8 -t 10 targetlist.txt
-v
Verbose output
-j <num_of_jobs>
Jobs to run (defaults to 1)
-t <time_in_seconds>
Timeout in seconds (defaults to 30 seconds)
targetlist.txt
Hosts list delimited by line
1 192.168.0.2
2 192.168.77.23
3 172.16.9.44
4 172.16.9.45
5 172.16.9.46
6 172.16.9.47
7 172.16.9.48
8 172.16.9.49
9 172.16.9.50


Limitations
Ties up a Linux VM while scanning
Needed for window focus and screenshotting
Will not alert on anything that is not cmd.exe
Ran across taskmgr.exe, mmc.exe, other custom applications







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Sticky Keys to the Kingdom

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  Sticky Keys tothe Kingdom PRE-AUTH SYSTEM RCE ON WINDOWS IS MORE COMMON THAN YOU THINK DENNIS MALDONADO & TIM MCGUFFIN LARES

- 2.

  About Us • DennisMaldonado • Adversarial Engineer – LARES Consulting • Founder • Houston Locksport • Houston Area Hackers Anonymous (HAHA) • Tim McGuffin • RedTeam Manager – LARES Consulting • 10-year DEFCON Goon • DEFCON CTF Participant • Former CCDCTeam Coach www.lares.com

- 3.

  History • “How toResetWindows Passwords” websites • Replace sethc.exe or utilman.exe with cmd.exe • Reboot, Press Shift 5x orWIN+U • net user (username) (password) • Login! • Nobody ever cleans up after themselves • Can be used as a backdoor/persistence method • NoWindows Event Logs are generated when backdoor is executed

- 4.

  Implementation • Binary Replacement •Replace any of the accessibility tool binaries • Requires elevated rights • Registry (Debugger Method) • HKLMSoftwareMicrosoftWindows NTCurrentVersionImage File Execution Optionssethc.exe • Debugger REG_SZ C:WindowsSystem32cmd.exe • Requires elevated rights

- 5.

  Windows Accessibility Tools BinaryDescription How to access C:WindowsSystem32sethc.exe Accessibility shortcut keys Shift 5 times C:WindowsSystem32Utilman.exe Utility Manager Windows Key + U C:WindowsSystem32osk.exe On-Screen Keyboard Locate the option on the screen using the mouse C:WindowsSystem32Magnify.exe Magnifier Windows Key + [Equal Sign] C:WindowsSystem32Narrator.exe Narrator Windows Key + Enter C:WindowsSystem32DisplaySwitch.exe Display Switcher Windows Key + P C:WindowsSystem32AtBroker.exe Manages switching of apps

between desktops Have osk.exe, Magnify.exe, or Narrator.exe open then lock the computer. AtBroker.exe will be executed upon locking and unlocking

- 6.

  Limitations • Elevated accessor offline system required • Replacing binary must be Digitally Signed • Replacing binary must exist in System32 • Replacing binary must exist inWindows “Protected File” list • You can’t use any old Binary, but you can cmd.exe /c file.bat

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- 15.

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- 17.

  Statistics • On alarge Business ISP: • Over 100,000 boxes scanned • About 571 Command Prompts • 1 out of 175 • All types of Institutions • Educational Institutions • Law Offices • Manufacturing Facilities • Gaming companies • Etc…

- 18.

Recommendations • Remediation • Deleteor replace the affected file (sethc.exe, utilman.exe, …) • sfc.exe /scannnow • Remove the affected registry entry • Treat this as an indicator of compromise • Prevention and Detection • Restrict local administrative access • Enable full disk encryption • Network LevelAuthentication for Remote Desktop Connection • End point monitoring • Netflow analysis

- 19.

  Tool Release • Codeis on Github • https://github.com/linuz/Sticky-Keys-Slayer • Contribute • Report Issues • Send us feedback • Slides • http://www.slideshare.net/DennisMaldonado5/sticky-keys- to-the-kingdom • DemoVideo • https://www.youtube.com/watch?v=Jy4hg4a1FYI www.lares.com

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