CodeEngn 2010

Art of Keylogging

Keyloggers who are nothing to do with the keyboard security solution

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Who am I?

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  - NEXON / Security Team – Hacking Analysis, Security Programming
  - A contributor to “Microsoftware” a monthly IT Magazine for over 2 years
  - A lecturer on hacking/reversing/security at various institutions (KISA, security community, universities, etc)
  - 2009 Microsoft MVP Developer Security

Agenda

- Prologue
- Keylogging Windows Account
- Login without password
- Keylogging on the website
- Social Engineering Keylogging
- Bypass Keyboard security solution
- Offensive and defensive

Prologue

Serious account issues

Endless account problems

- Why do we still face many problems even after Keyboard security solution is installed ?
- What is the trend of malicious code today ?
- What we must do ?

Endless account problems

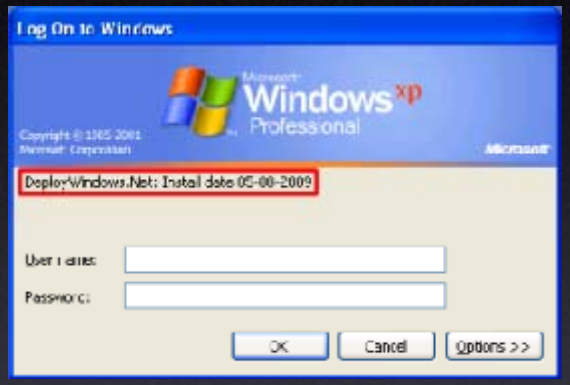
Trojan-PWS/W32.WebGame.101888.K
Trojan-PWS/W32.WebGame.102768.B
Trojan-PWS/W32.WebGame.102805
Trojan-PWS/W32.WebGame.103150
Trojan-PWS/W32.WebGame.103182
Trojan-PWS/W32.WebGame.103463
Trojan-PWS/W32.WebGame.103556
Trojan-PWS/W32.WebGame.103810
Trojan-PWS/W32.WebGame.10524
Trojan-PWS/W32.WebGame.10724
Trojan-PWS/W32.WebGame.10764
Trojan-PWS/W32.WebGame.110145
Trojan-PWS/W32.WebGame.111085
Trojan-PWS/W32.WebGame.11218
Trojan-PWS/W32.WebGame.116274
Trojan-PWS/W32.WebGame.116606
Trojan-PWS/W32.WebGame.116822

.....

Hundreds of viruses signature are added each day

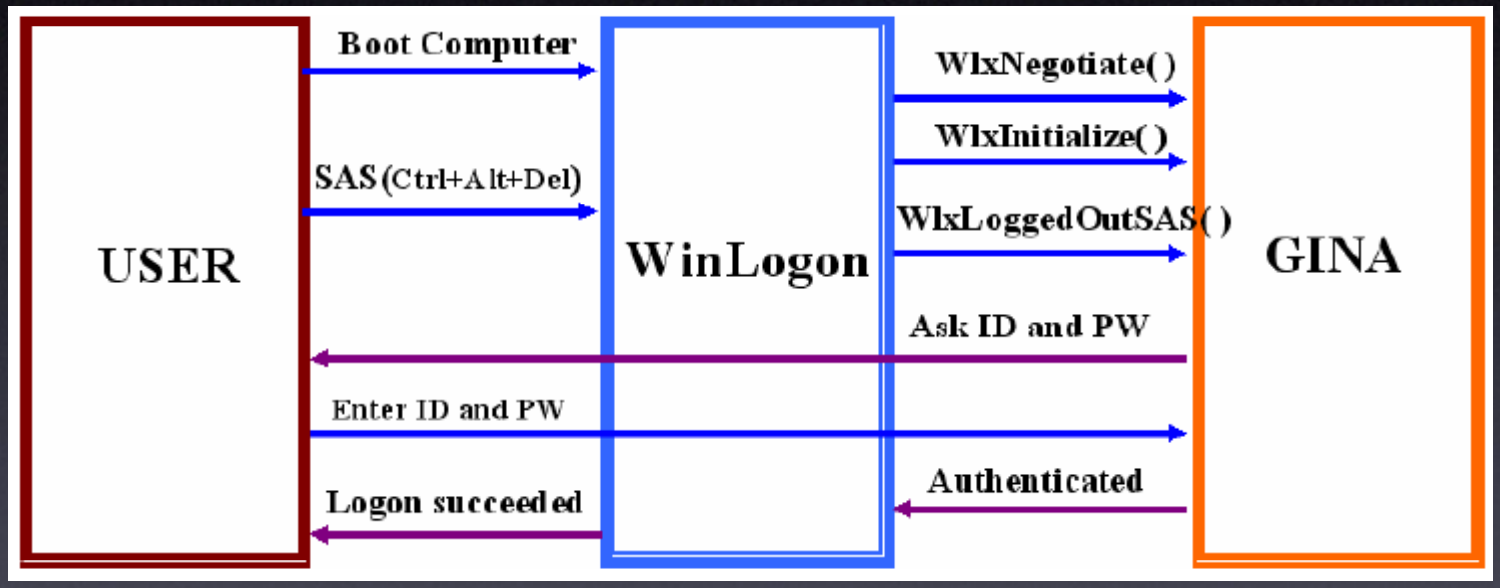
Keylogging Windows Account

Windows Account



the winlogon.exe is what you come to face when you walk up to a locked or un-logged-on computer.

msgina structure



Interaction between winlogon and GINA

msgina structure

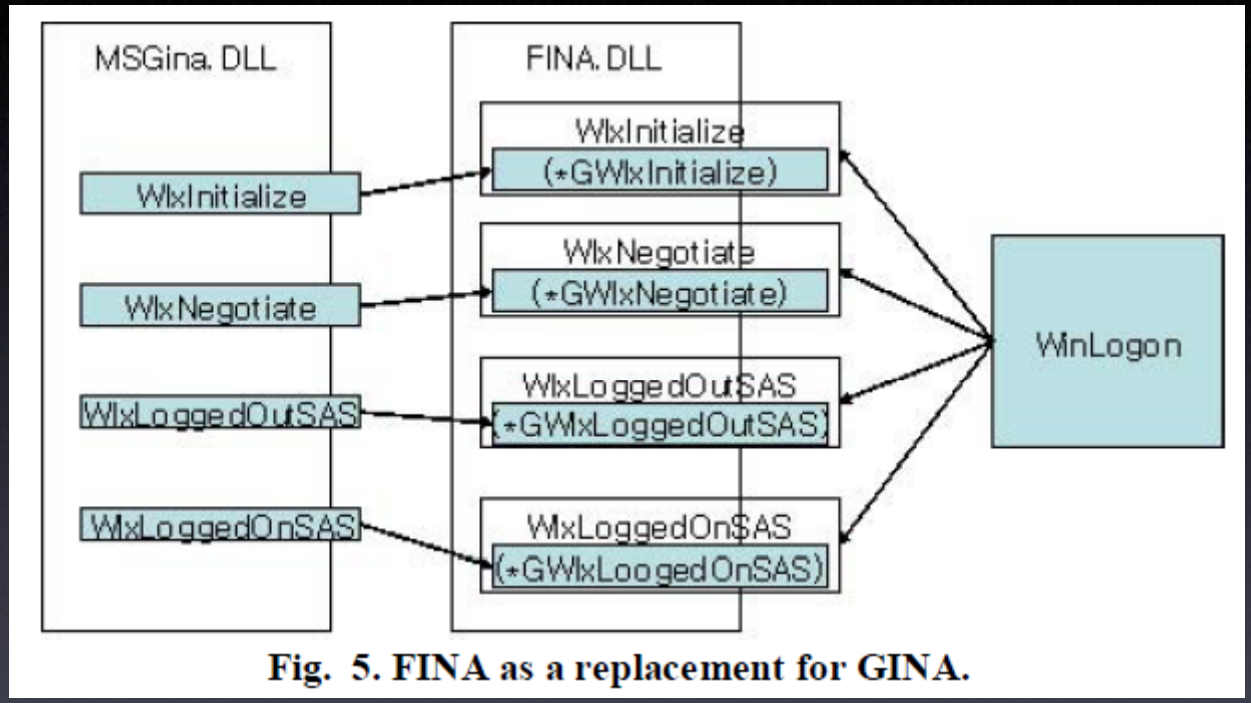


Fig. 5. FINA as a replacement for GINA.

The library file msgina.dll, is required by windows. It is used by WinLogon within windows, when performing user authentication.

WlxLoggedOutSAS

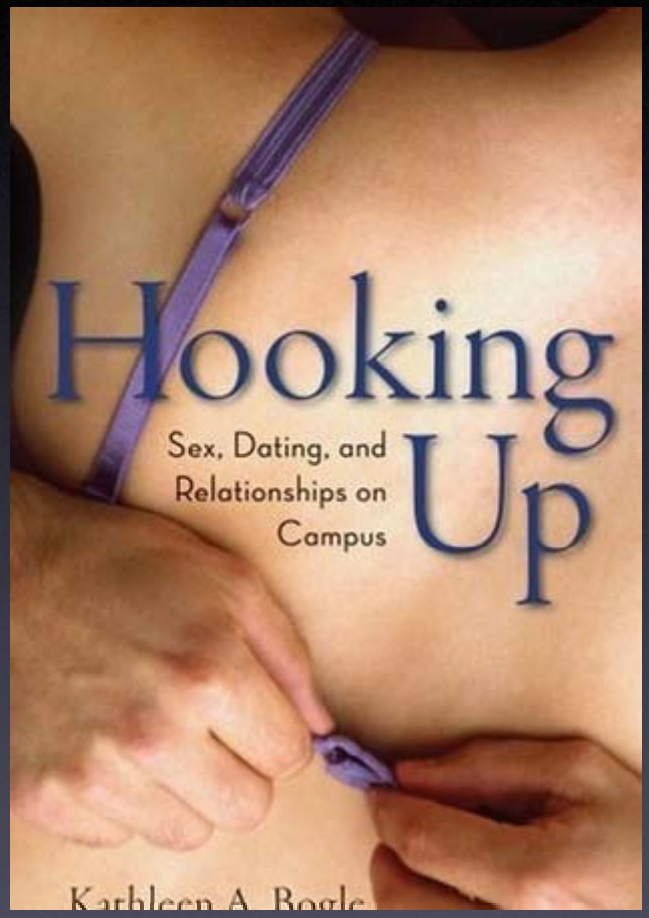
```
int WlxLoggedOutSAS(
    PVOID pWlxContext,
    DWORD dwSasType,
    PLUID pAuthenticationId,
    PSID pLogonSid,
    PDWORD pdwOptions,
    PHANDLE phToken,
    PWLX_MPR_NOTIFY_INFO pNprNotifyInfo,
    PVOID *pProfile );
```

WLX_MPR_NOTIFY_INFO

```
Typedef struct _WLX_MPR_NOTIFY_INFO {
   PWSTR pszUserName;
   PWSTR pszDomain;
   PWSTR pszPassword;
   PWSTR pszOldPassword; } LX_MPR_NOTIFY_INFO;
```

Here we can see a meaningful structure !!!

msgina Hooking



Reversing msgina Malware

Naming

- winlogonHijacker
- Domain Keylogger.

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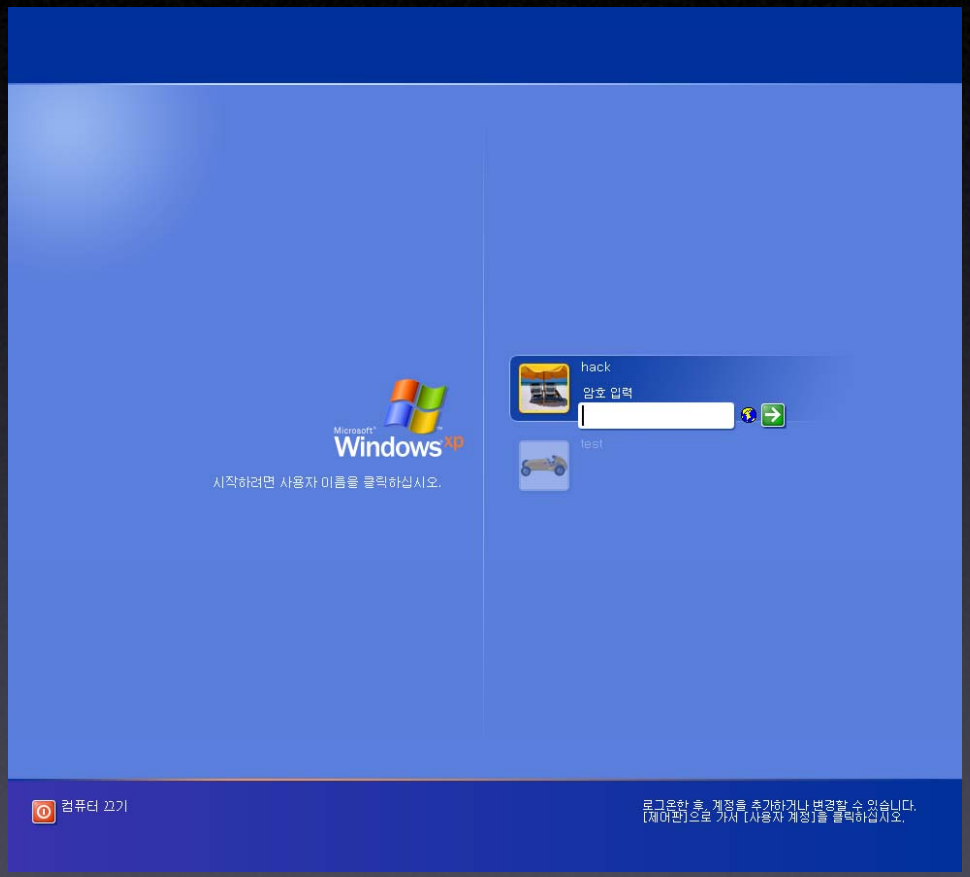
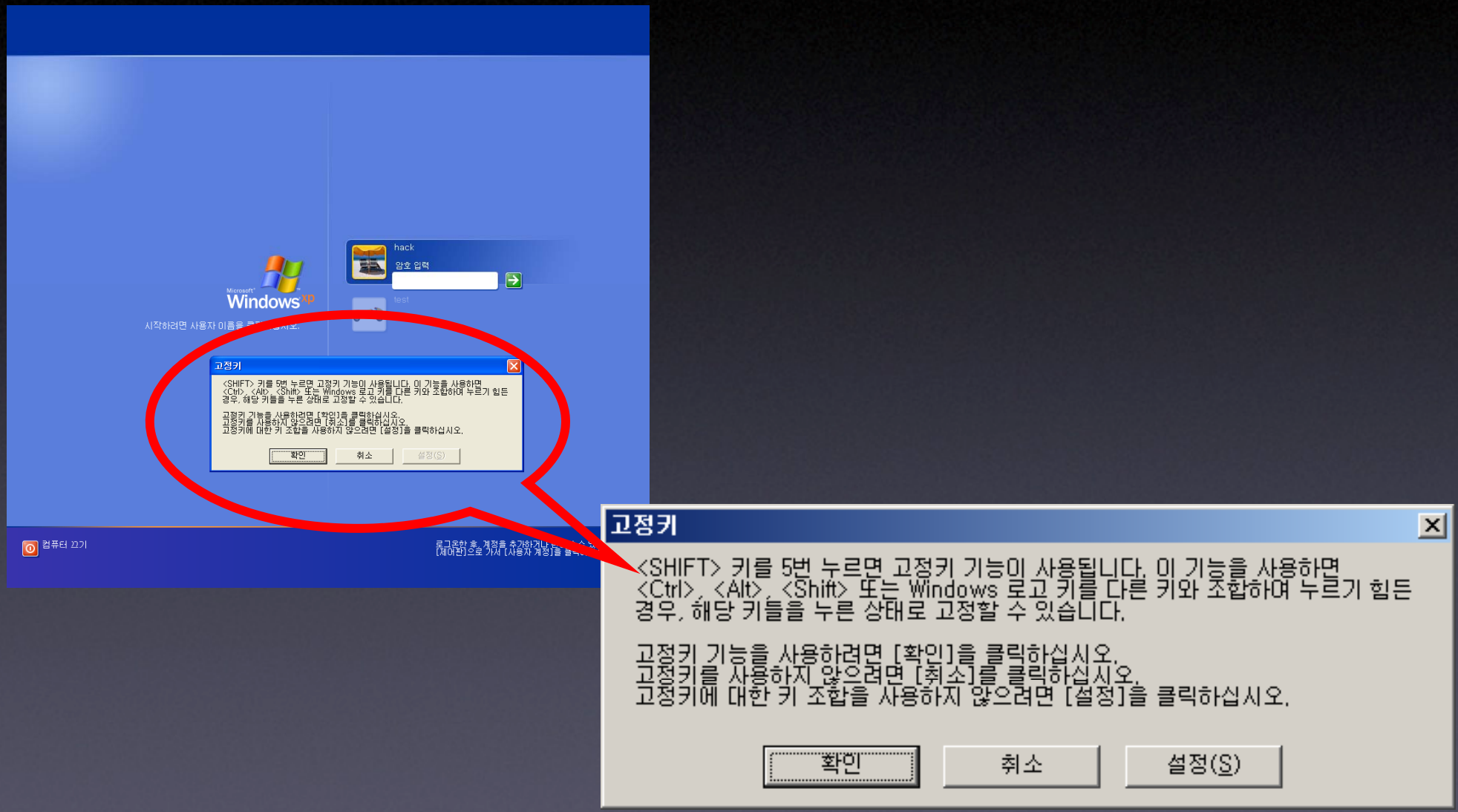
Login without Password

Windows Account



If you press the Shift key 5 times…

StickKey Popup



StickKey run structure

Winlogon thread

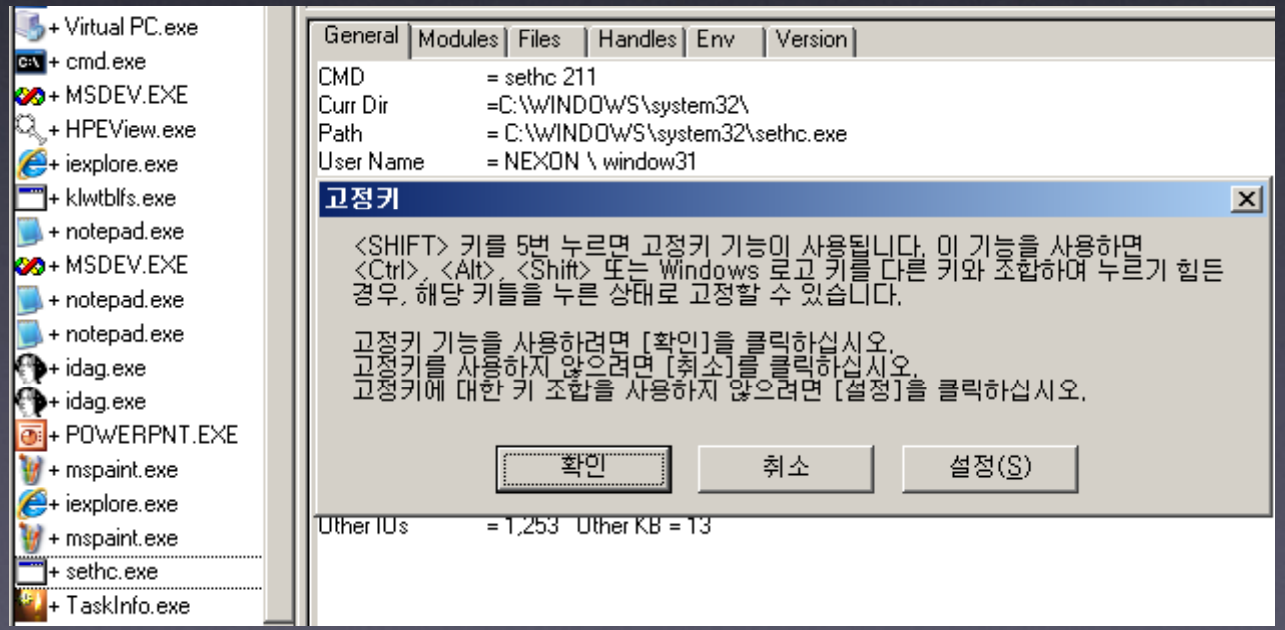
CreateProcess

Run sethc.exe

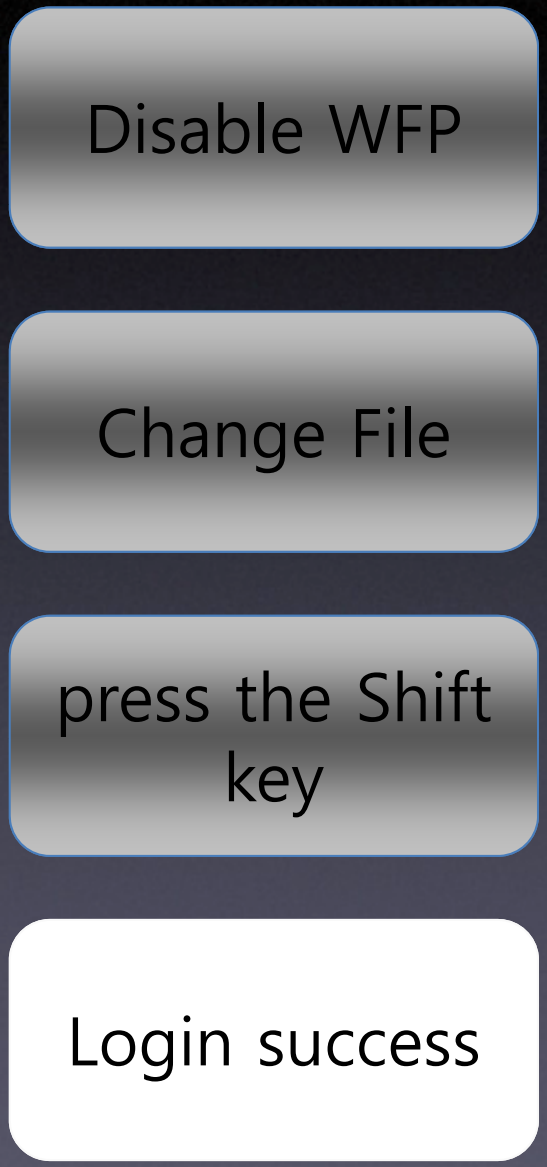
View StickKey DialogBox

StickKey Local Backdoor

- You are able to connect without ID/PW !!!
- You can see the explorer or command prompt at the login prompt without authentication.

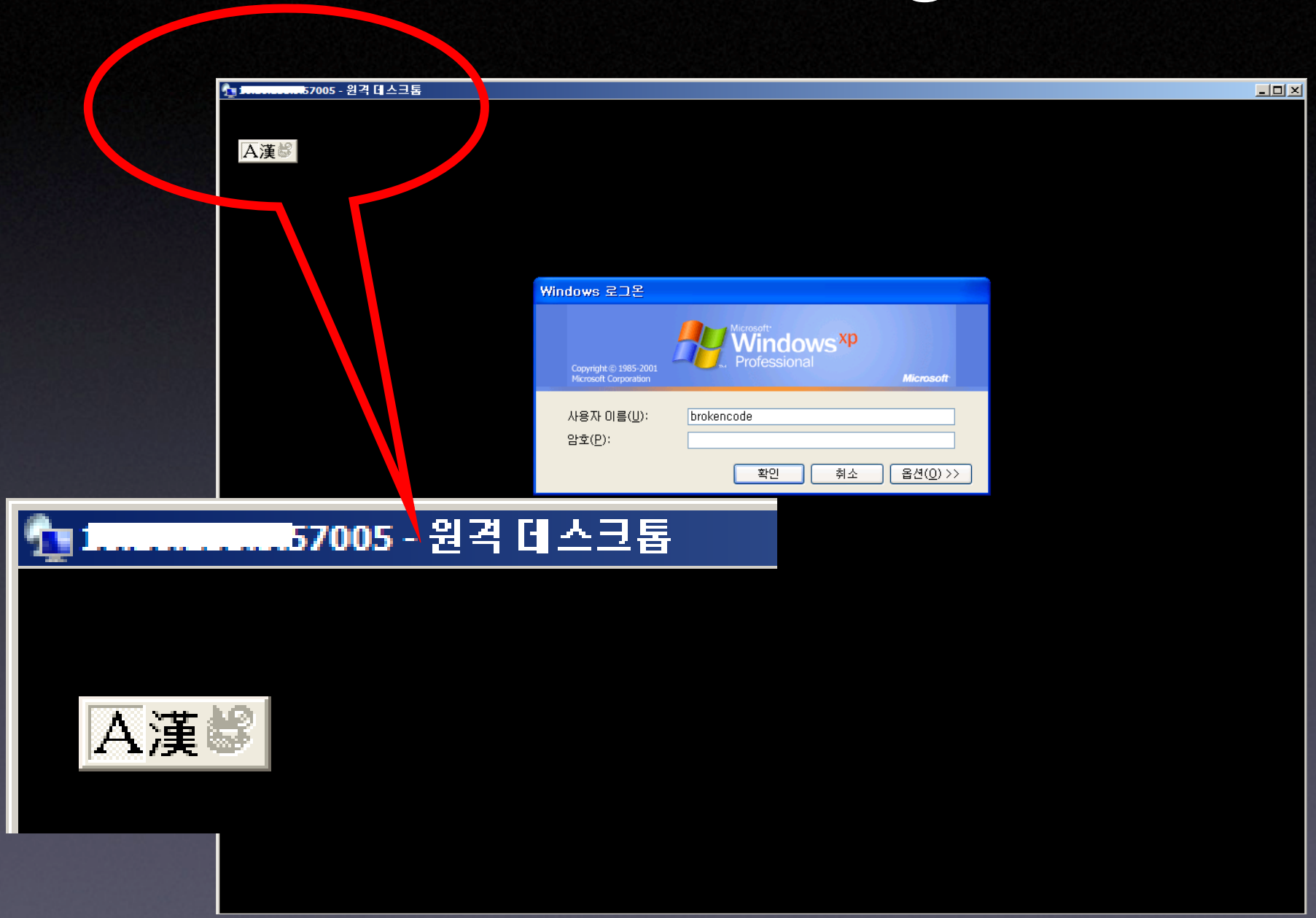


Behavior structure



- Disable WFP (Windows File Protection)
- Replace the files.
- Now, If I press key five times, I can login at any time.

Terminal Login



Next action

- Create a new user account,
  "c:₩net user iamhacker /add"

- Add this user to the administrators group
  "c:₩net localgroup administrators iamhacker"

- Remove StickKey Local Backdoor and Enable WFP
  (To avoid as doubt as hacking)

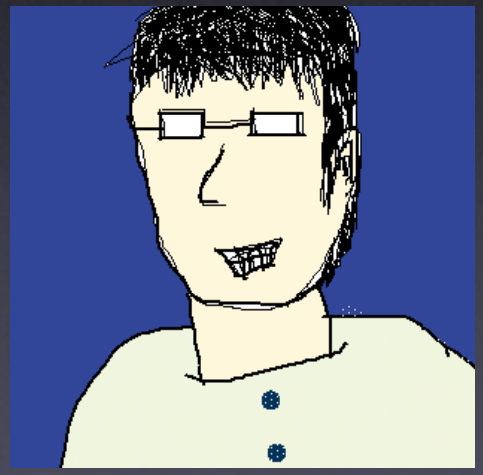
Which platform is this vulnerability?

- Windows 2000
- Windows XP
- Windows 2003
- Windows Vista

Most of windows OS does not check the integrity of the file that launches StickyKeys “sethc.exe” before executing it.

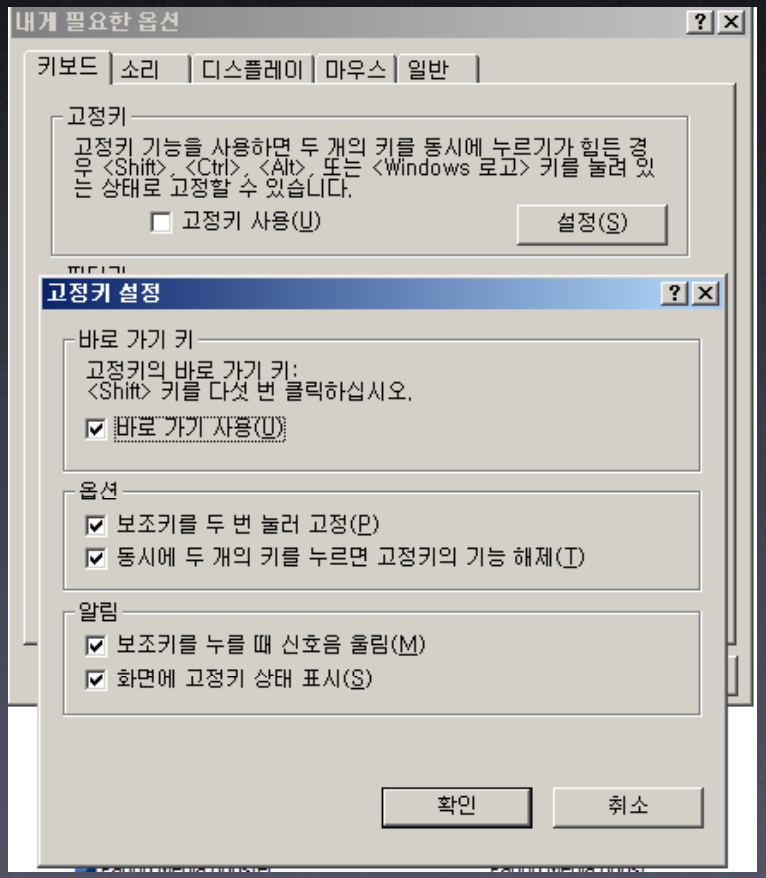
From now on

Don’t forget to hit the shift key five times and see what pops up on your desktop ….everyday :p



Remove StickKey

This is the real answer.



Reversing stickkey Malware

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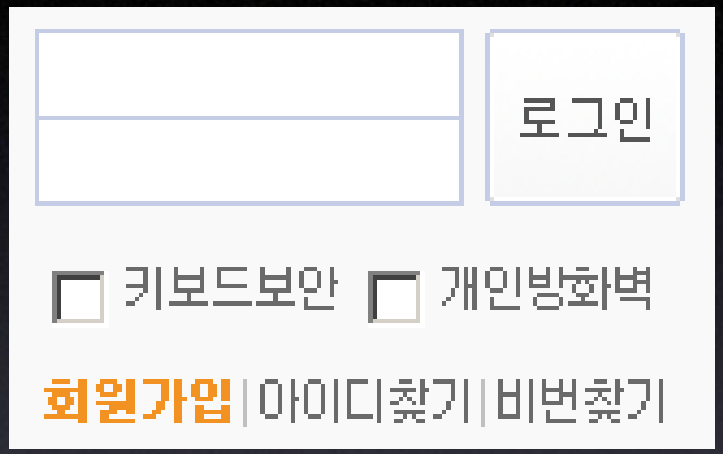
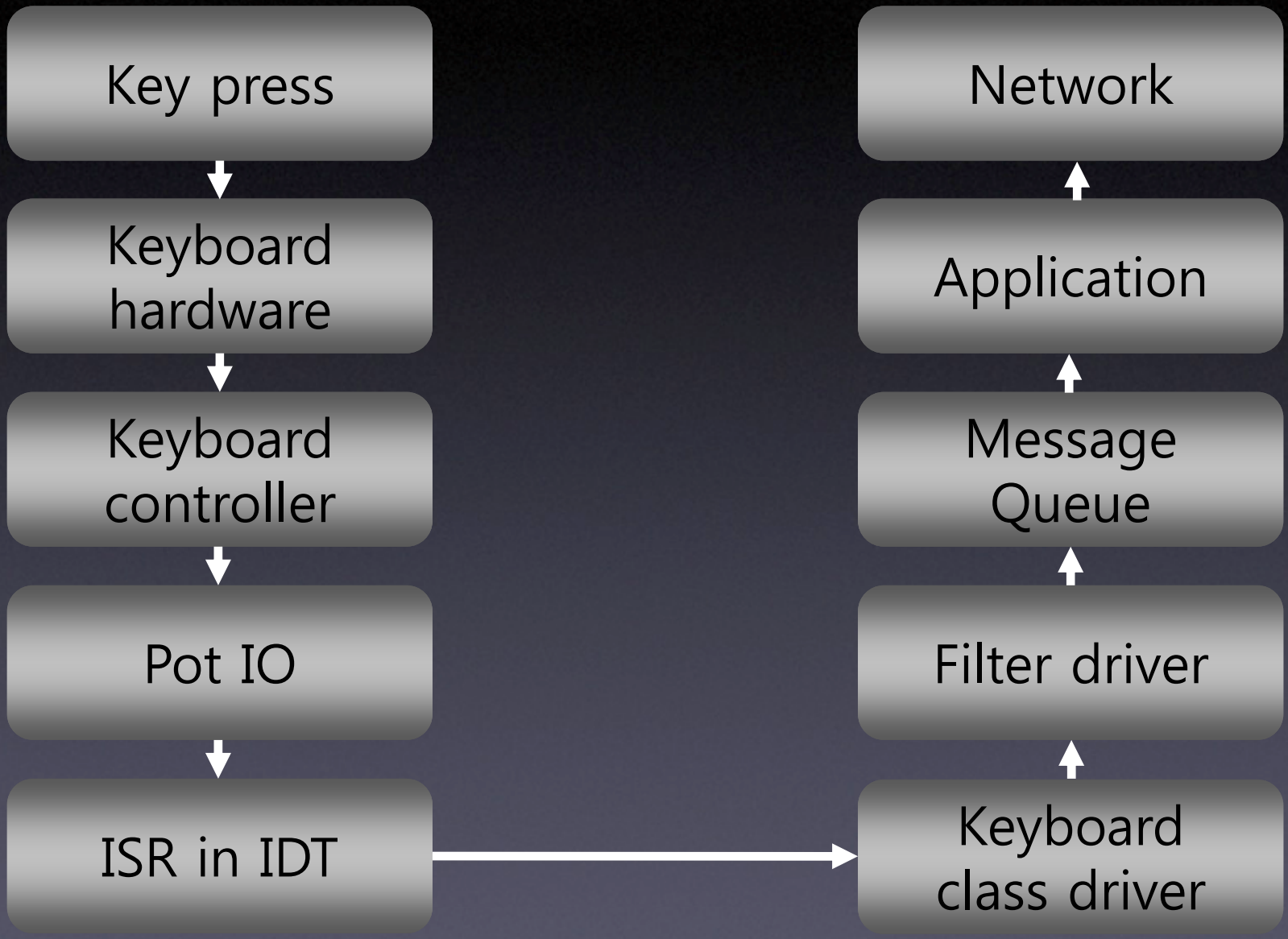
Keylogging on the website

Web-based login

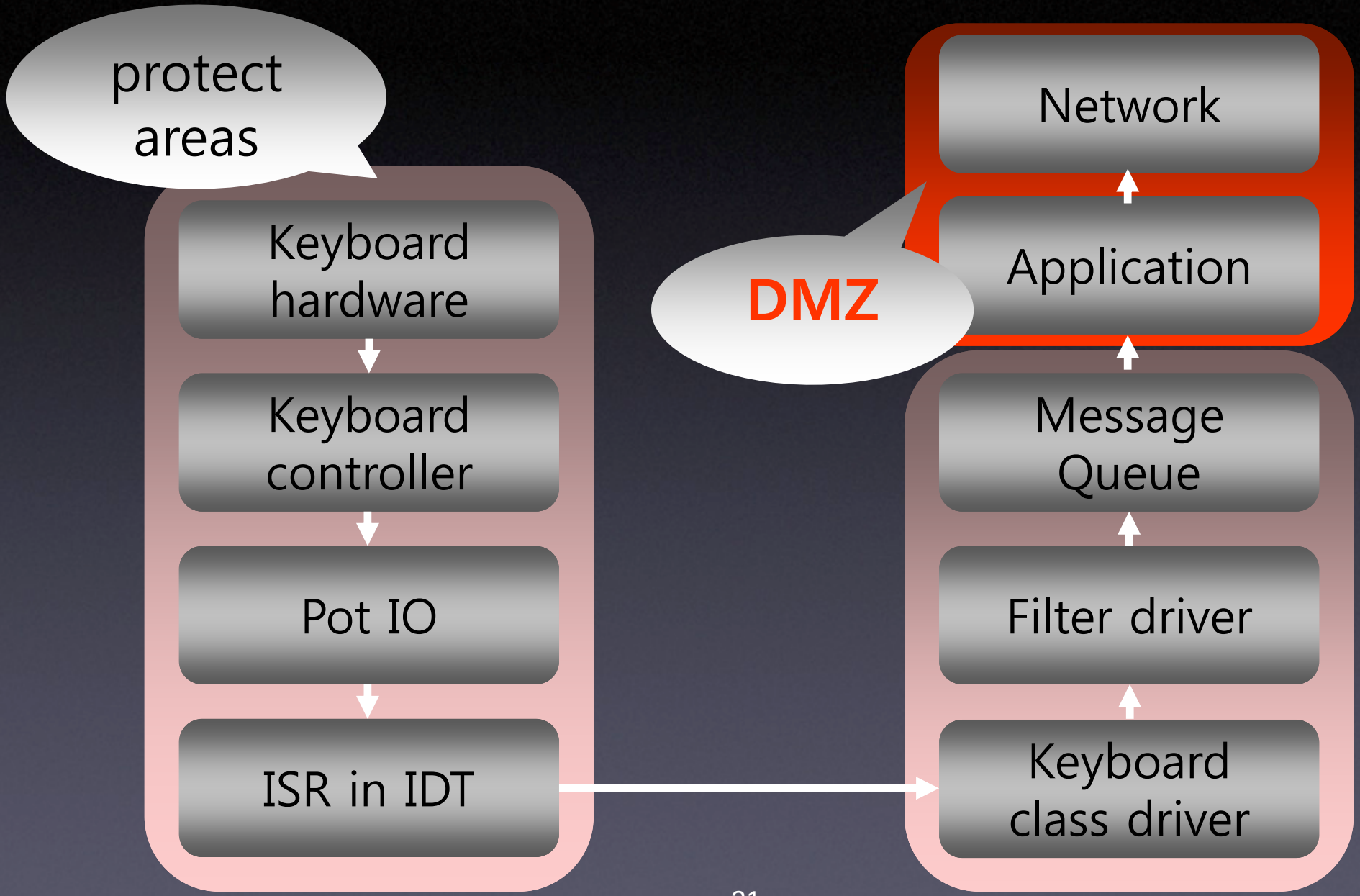


- Very vulnerable
- Method of attack is varied
- Keyboard security solution exists (Almost always)

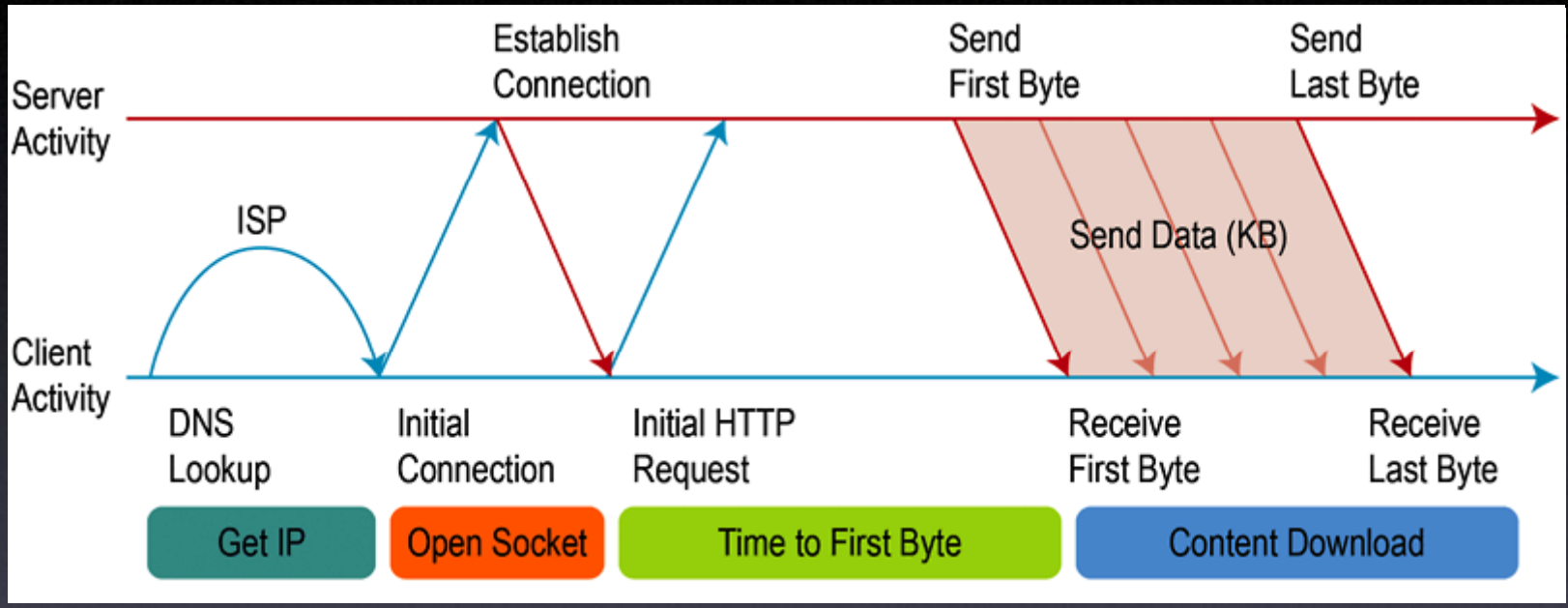
Attack position



Keyboard security solution



Protocol handler

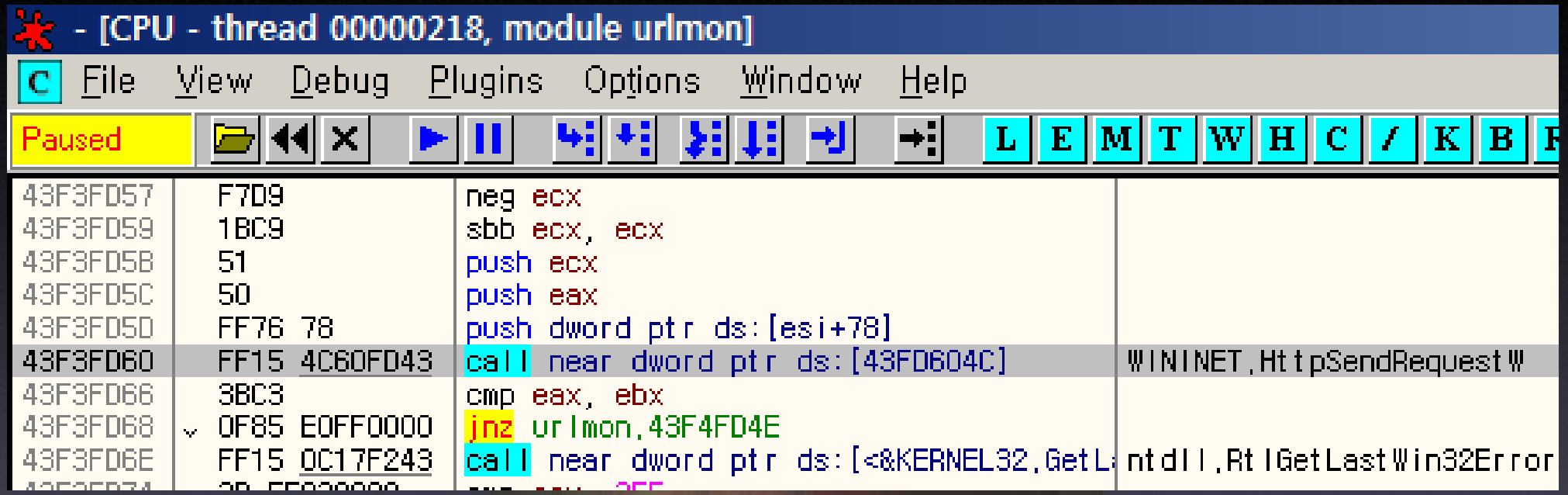


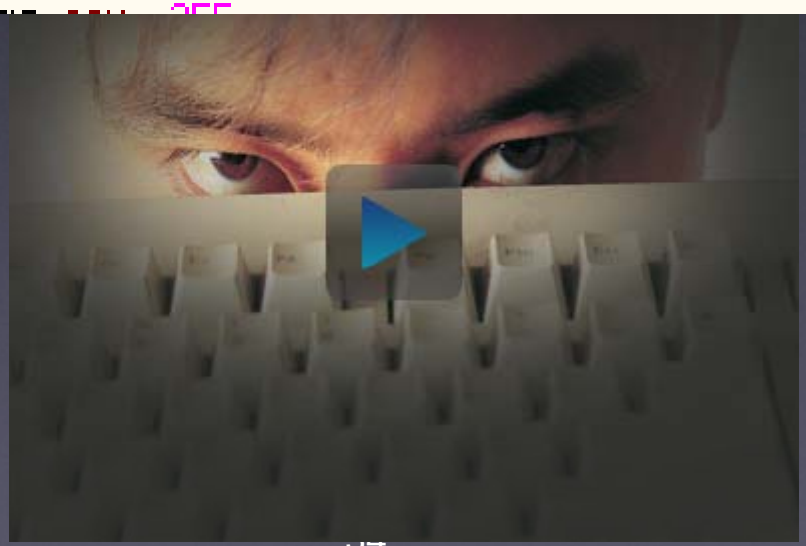
Wininet.dll is the protocol handler for HTTP, HTTPS and FTP. It handles all network communication over these protocols.

Query hook

url=http%3A%2F%2Fwindow31.com&fail_url=&loginsite=&site_id=31&adult_yn=N&encoding_type=utf-8&ukey=1BB7E5F2937203480D408B5196E9AC3B9DDF487E636EA15426FAEABDAFB00A6908F2069ECB5FA6C7B618E4C68C5F37C2900DB07DE9A0CACEC7300A6DBD342A83&game_id=13&**id=window31**&**pwd=fucking**

The API issue





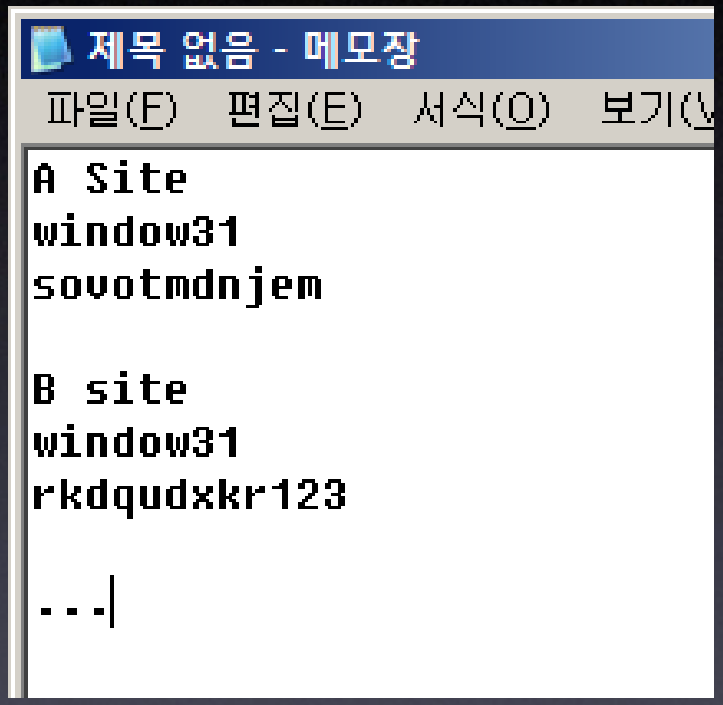
Reversing malware

DEMO

Social Engineering Keylogging

Human habits

Bad habit



We do copy and paste unconsciously.
Even the password.

Funny Code

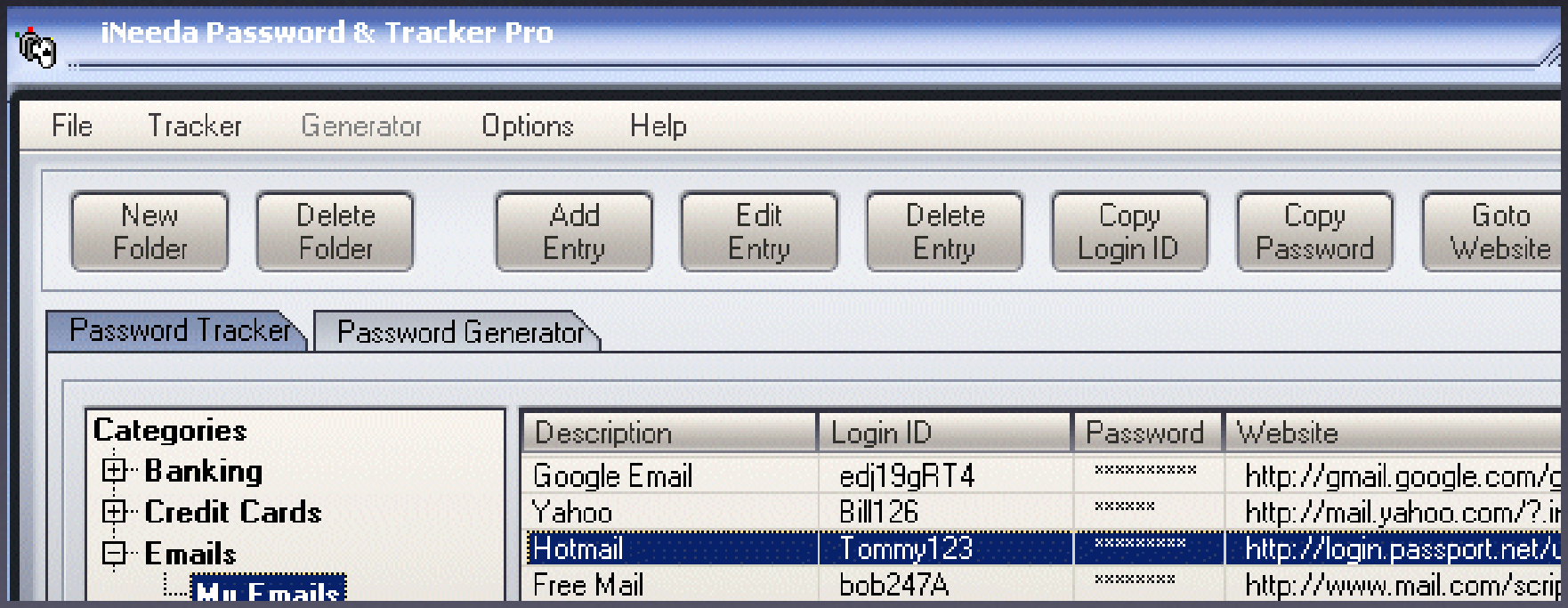
```
while(1)
{
    // ...
    GetClipBoardData(CF_TEXT);

    // ...
    if (bMaybePW)
        SendDataToHacker();

    Sleep(500);
}
```

Problems

- This technique is based on the human behavior.
- You do not have a login, you can be attacked (for example, paperwork etc).



Bypass
Keyboard security solution

Why?

Offensive and defensive

Hooking detection.

13:12:31:889 [0x756E40D4] jmp msg1na.dll.0xB0A588
13:12:31:889 Found inject code !!! 5 byte diff
13:12:31:889 doubt module: [pid: 420] ₩??₩C:₩WINDOWS₩system32₩winlogon.exe - c:₩windows₩system32₩msgina.dll
13:12:31:889 [KEYLOGGER] Domain Keylogger detect !!!! winlogon.exe - msgina.dll inject

I hope AntiVirus vendors.

- WFP check
- Check sethc.exe
- StickyKeys option turns off.
- Winlogon dll injection, integrity check

Conclusion

- Keyboard security solution can not prevent everything
- Each location requires different security.

  (ex. kernel : ring0, app : integrity check)
- Parameters should be encrypted.
- Let's try reversing a lot of malicious code. We can get a hint and we learn a lot of their technology.
- The AntiVirus should be upgraded more behavior-based features

Question

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