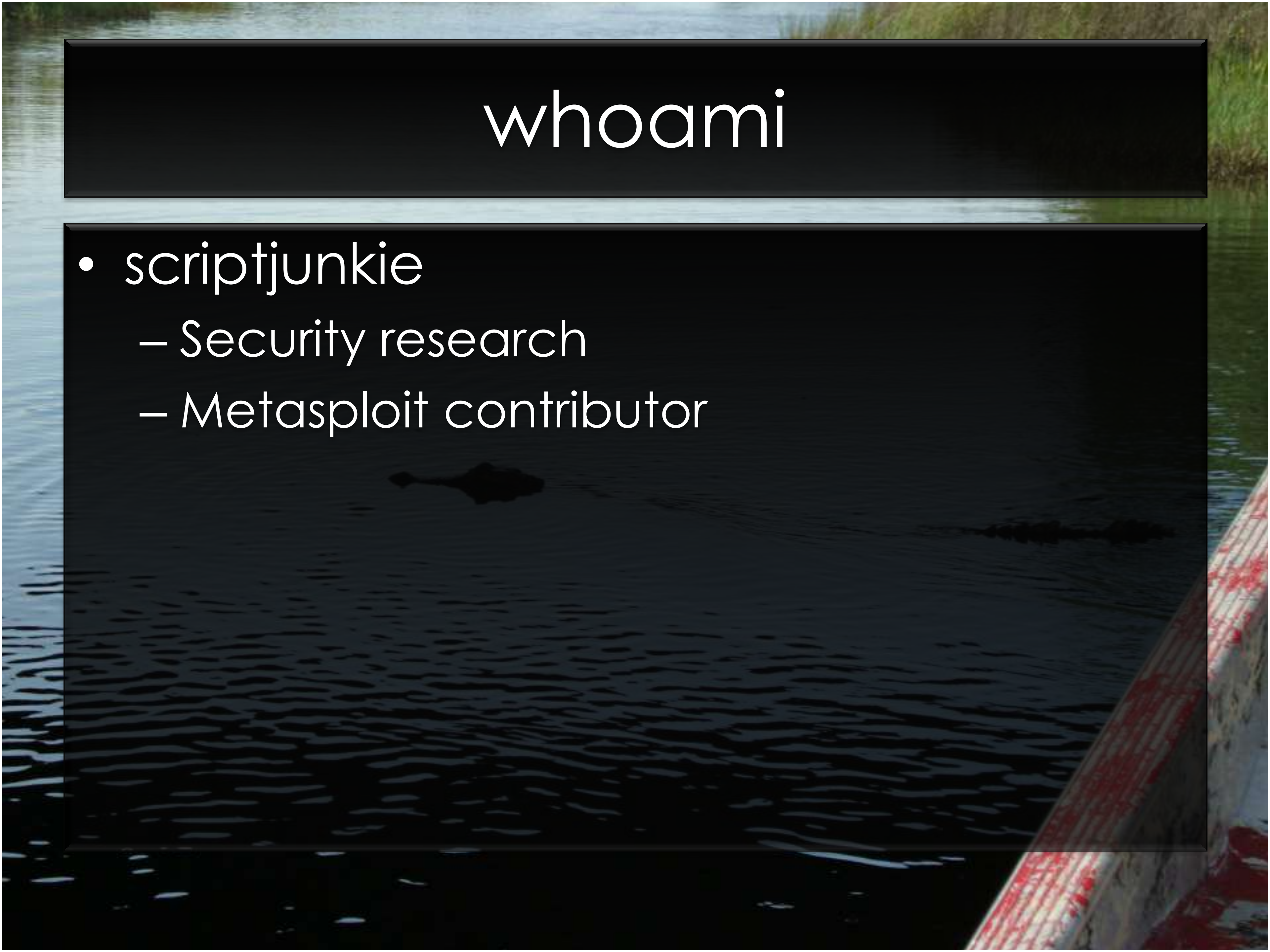
Counterattack

Turning the tables on exploitation attempts from tools like Metasploit

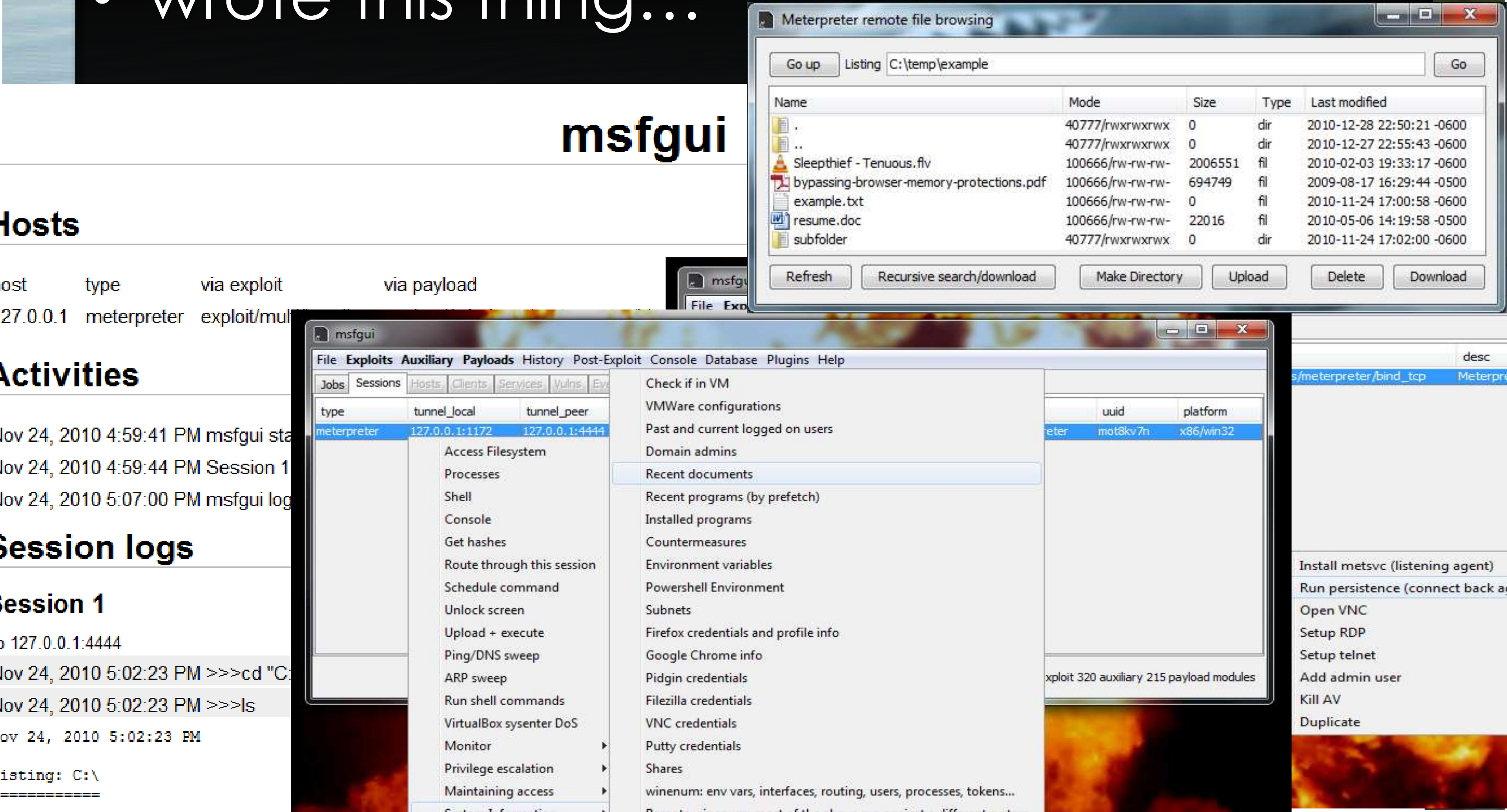


whoami

- scriptjunkie
  - Security research
  - Metasploit contributor

whoami

- wrote this thing...



msfgui

Hosts

```
ost        type          via exploit        via payload
27.0.0.1   meterpreter   exploit/mul
```

Activities

```
lov 24, 2010 4:59:41 PM msfgui sta
lov 24, 2010 4:59:44 PM Session 1
lov 24, 2010 5:07:00 PM msfgui log
```

Session logs

Session 1

```
o 127.0.0.1:4444
lov 24, 2010 5:02:23 PM >>>cd "C:
lov 24, 2010 5:02:23 PM >>>ls
ov 24, 2010 5:02:23 PM

isting: C:\
===========
```

Meterpreter remote file browsing

Go up | Listing C:\temp\example | Go

Name	Mode	Size	Type	Last modified
.	40777/rwxrwxrwx	0	dir	2010-12-28 22:50:21 -0600
..	40777/rwxrwxrwx	0	dir	2010-12-27 22:55:43 -0600
Sleepthief - Tenuous.flv	100666/rw-rw-rw-	2006551	fil	2010-02-03 19:33:17 -0600
bypassing-browser-memory-protections.pdf	100666/rw-rw-rw-	694749	fil	2009-08-17 16:29:44 -0500
example.txt	100666/rw-rw-rw-	0	fil	2010-11-24 17:00:58 -0600
resume.doc	100666/rw-rw-rw-	22016	fil	2010-05-06 14:19:58 -0500
subfolder	40777/rwxrwxrwx	0	dir	2010-11-24 17:02:00 -0600

Refresh | Recursive search/download | Make Directory | Upload | Delete | Download

msfgui

File Exploits Auxiliary Payloads History Post-Exploit Console Database Plugins Help

Jobs | Sessions | Hosts | Clients | Services | Vulns | Ev

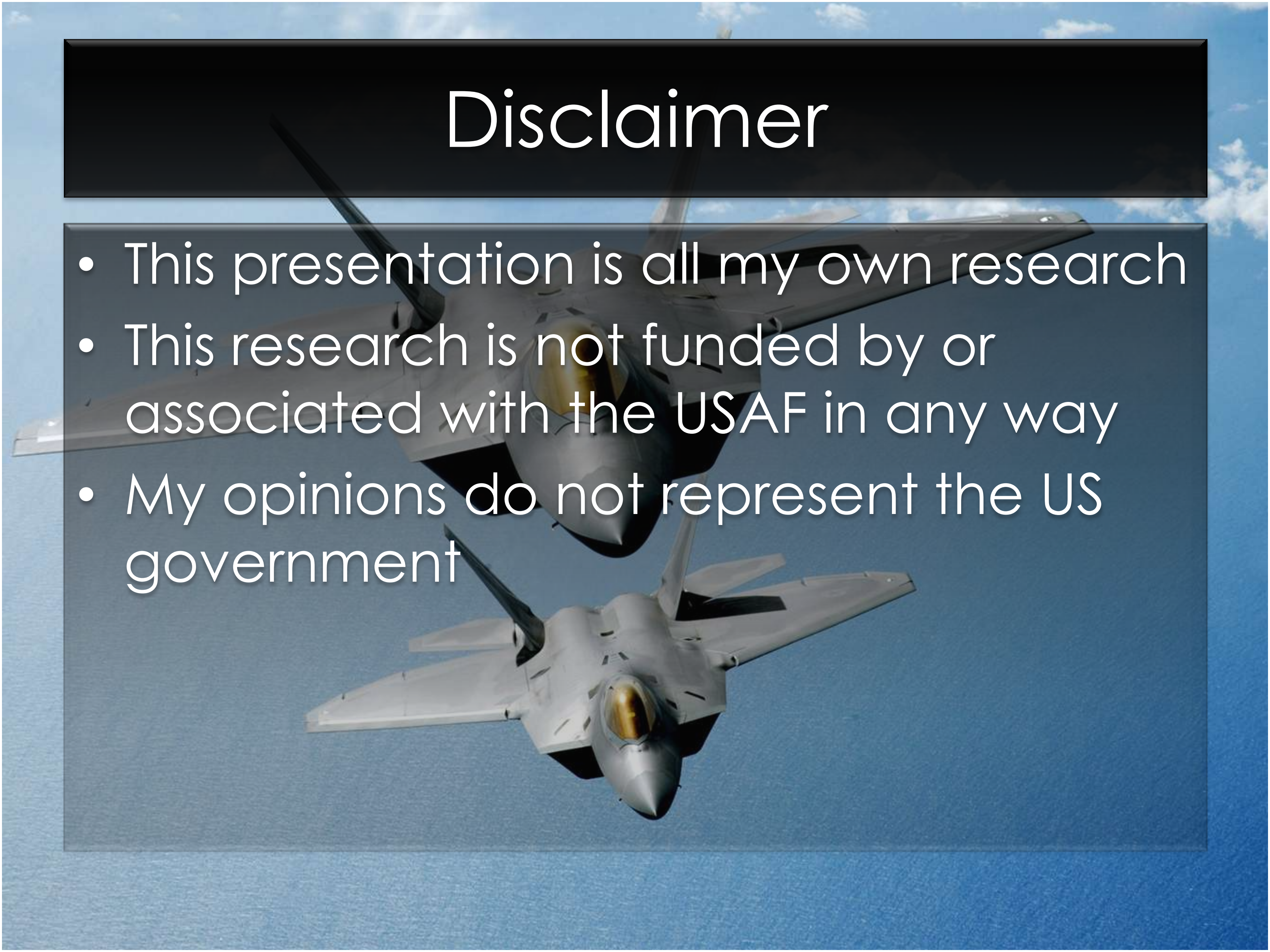
type	tunnel_local	tunnel_peer		uuid	platform
meterpreter	127.0.0.1:1172	127.0.0.1:4444	eter	mot8kv7n	x86/win32

	desc
s/meterpreter/bind_tcp	Meterpre

xploit 320 auxiliary 215 payload modules

whoami

- I work here



Disclaimer

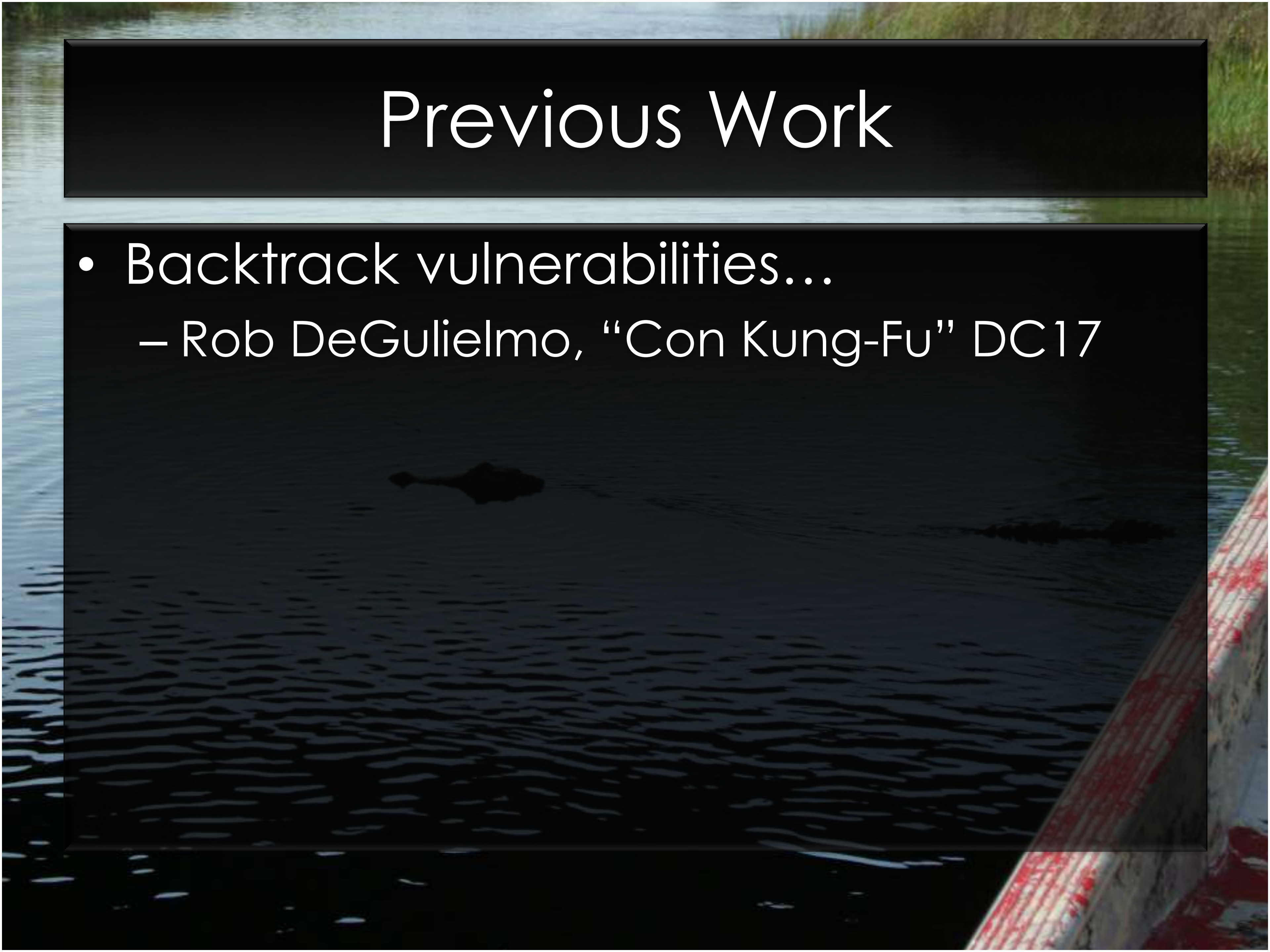
- This presentation is all my own research
- This research is not funded by or associated with the USAF in any way
- My opinions do not represent the US government

Previous work

- Honeypots

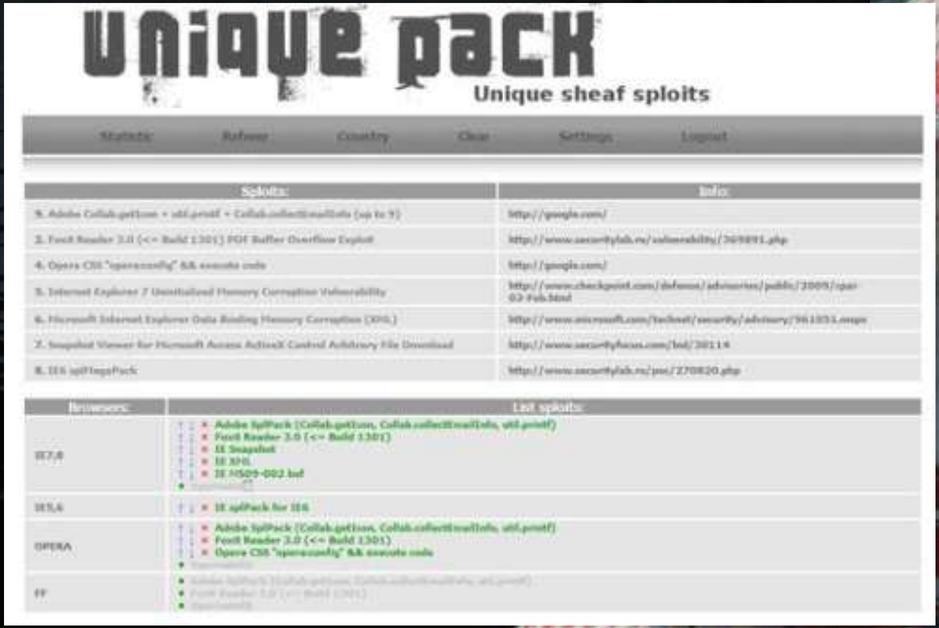
Previous Work

- Backtrack vulnerabilities…
  - Rob DeGulielmo, “Con Kung-Fu” DC17



Exploit pack Exploits

- LuckySploit, UniquePack referrer XSS
  - Paul Royal, Purewire, August 2009
- Zeus
  - BK, xs-sniper.com Sept 2010



Sploits:	Info:
9. Adobe Collab.getIcon + util.printf + Collab.collectEmailInfo (up to 9)	http://google.com/
2. Foxit Reader 3.0 (<= Build 1301) PDF Buffer Overflow Exploit	http://www.securitylab.ru/vulnerability/369891.php
4. Opera CSS "operaconfig" && execute code	http://google.com/
5. Internet Explorer 7 Uninitialized Memory Corruption Vulnerability	http://www.checkpoint.com/defense/advisories/public/2009/cpai-03-Feb.html
6. Microsoft Internet Explorer Data Binding Memory Corruption (XML)	http://www.microsoft.com/technet/security/advisory/961051.mspx
7. Snapshot Viewer for Microsoft Access ActiveX Control Arbitrary File Download	http://www.securityfocus.com/bid/30114
8. IE6 splFlegsPack	http://www.securitylab.ru/poc/270820.php

Browsers:	Last sploits:
IE7,8	Adobe SplPack (Collab.getIcon, Collab.collectEmailInfo, util.printf) Foxit Reader 3.0 (<= Build 1301) IE Snapshot IE XML IE MS09-002.bof [illegible]
IE5,6	IE splPack for IE6
OPERA	Adobe SplPack (Collab.getIcon, Collab.collectEmailInfo, util.printf) Foxit Reader 3.0 (<= Build 1301) Opera CSS "operaconfig" && execute code [illegible]
FF	Adobe SplPack (Collab.getIcon, Collab.collectEmailInfo, util.printf) Foxit Reader 3.0 (<= Build 1301) [illegible]

Ethics

- Some ideas:
  - Self-defense
  - Neutralizing
  - Unintended Consequences
  - Worms
- Left as an exercise for the student

Generic Counterattacks

- Worms
  - Get weaponized version of exploit
  - Neutralize attacking systems
  - Be careful!

Windows Counterattacks

- SMB is your friend
- Getting attackers to bite
  - May require IE
  - Vulnerable-looking web pages that only work on IE 6?
- SMB relay FTW!
- Or at least capture

Demo

Popular security tools

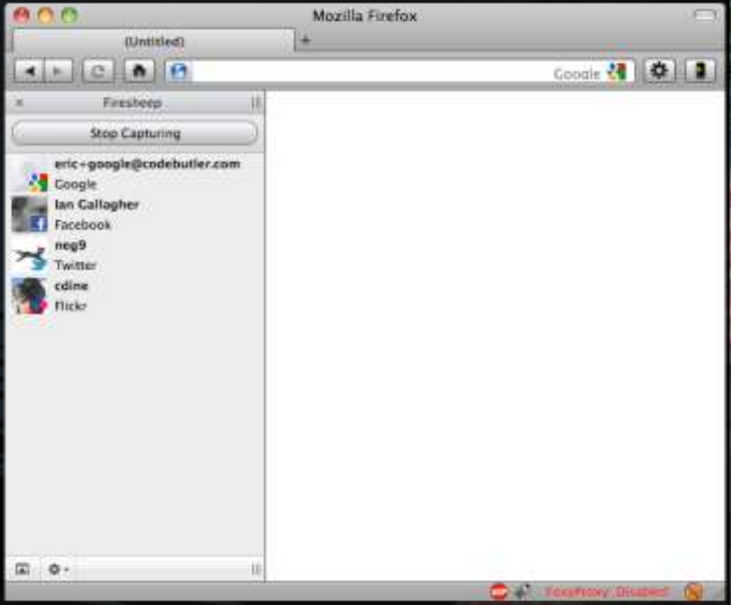
- Nmap
- Firesheep
- Nessus
- Cain & Abel
- Snort
- Wireshark
- Metasploit

Nmap

- No RCE
- Can still mislead
- Open ports
- Tarpits
- DoS
- Demo

Firesheep

- And then there's blacksheep to detect
- And there's fireshepherd to DoS



Nessus

- CVE-2010-2989
  - nessusd_www_server.nbin in the Nessus Web Server plugin 1.2.4 for Nessus allows remote attackers to obtain sensitive information via a request to the /feed method.
- CVE-2010-2914
  - Cross-site scripting (XSS) vulnerability in nessusd_www_server.nbin in the Nessus Web Server plugin 1.2.4 for Nessus.
- …

Cain & Abel

- CVE-2005-0807
  - Multiple buffer overflows in Cain & Abel before 2.67 allow remote attackers to cause a denial of service (application crash) and possibly execute arbitrary code via (1) an IKE packet with a large ID field that is not properly handled by the PSK sniffer filter, (2) the HTTP sniffer filter, or the (3) POP3, (4) SMTP, (5) IMAP, (6) NNTP, or (7) TDS sniffer filters.
- CVE-2008-5405
  - Stack-based buffer overflow in the RDP protocol password decoder in Cain & Abel 4.9.23 and 4.9.24, and possibly earlier...

Snort

- CVE-2009-3641
  - Snort before 2.8.5.1, when the -v option is enabled, allows remote attackers to cause a denial of service (application crash) via a crafted IPv6 packet that uses the (1) TCP or (2) ICMP protocol.
- CVE-2008-1804
  - preprocessors/spp_frag3.c in Sourcefire Snort before 2.8.1 does not properly identify packet fragments that have dissimilar TTL values, which allows remote attackers to bypass detection rules by using a different TTL for each fragment.

Wireshark

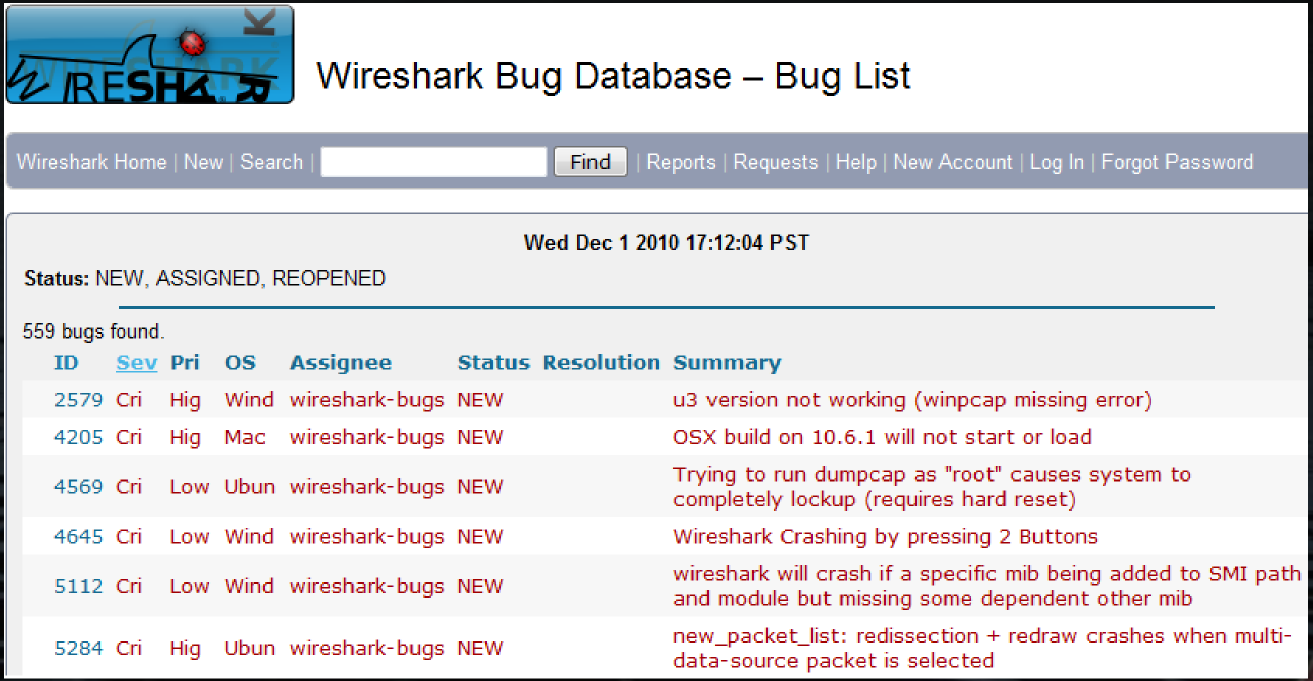
- CVE-2010-4301
  - epan/dissectors/packet-zbee-zcl.c in the ZigBee ZCL dissector in Wireshark 1.4.0 through 1.4.1 allows remote attackers to cause a denial of service (infinite loop) via a crafted ZCL packet…
- CVE-2010-4300
  - Heap-based buffer overflow in the dissect_ldss_transfer function (epan/dissectors/packet-ldss.c) in the LDSS dissector in Wireshark 1.2.0 through 1.2.12 and 1.4.0 through 1.4.1 …

Wireshark

- Vulnerabilities!
  - 100’s of protocol dissectors
  - Non memory-safe language
  - Usually run as root on linux
  - Build a fuzzer!

Wireshark

- Or just look it up



Wireshark Bug Database – Bug List

Wireshark Home | New | Search | Find | Reports | Requests | Help | New Account | Log In | Forgot Password

Wed Dec 1 2010 17:12:04 PST

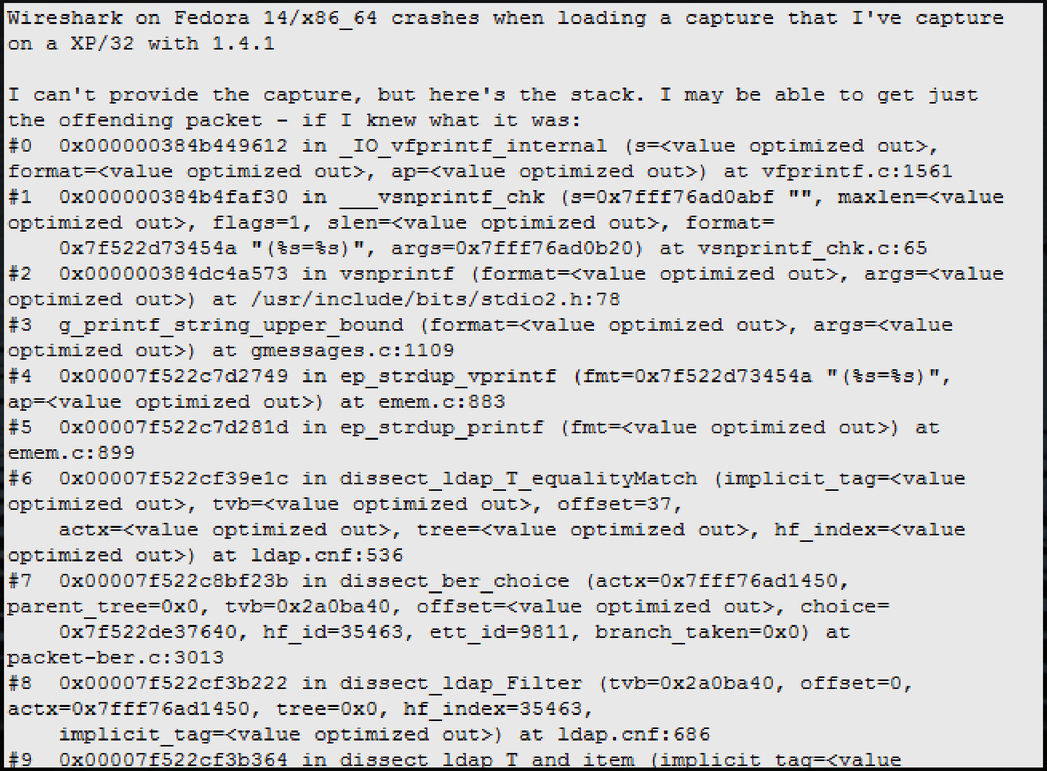
Status: NEW, ASSIGNED, REOPENED

559 bugs found.

ID	Sev	Pri	OS	Assignee	Status	Resolution	Summary
2579	Cri	Hig	Wind	wireshark-bugs	NEW		u3 version not working (winpcap missing error)
4205	Cri	Hig	Mac	wireshark-bugs	NEW		OSX build on 10.6.1 will not start or load
4569	Cri	Low	Ubun	wireshark-bugs	NEW		Trying to run dumpcap as "root" causes system to completely lockup (requires hard reset)
4645	Cri	Low	Wind	wireshark-bugs	NEW		Wireshark Crashing by pressing 2 Buttons
5112	Cri	Low	Wind	wireshark-bugs	NEW		wireshark will crash if a specific mib being added to SMI path and module but missing some dependent other mib
5284	Cri	Hig	Ubun	wireshark-bugs	NEW		new_packet_list: redissection + redraw crashes when multi-data-source packet is selected

Wireshark

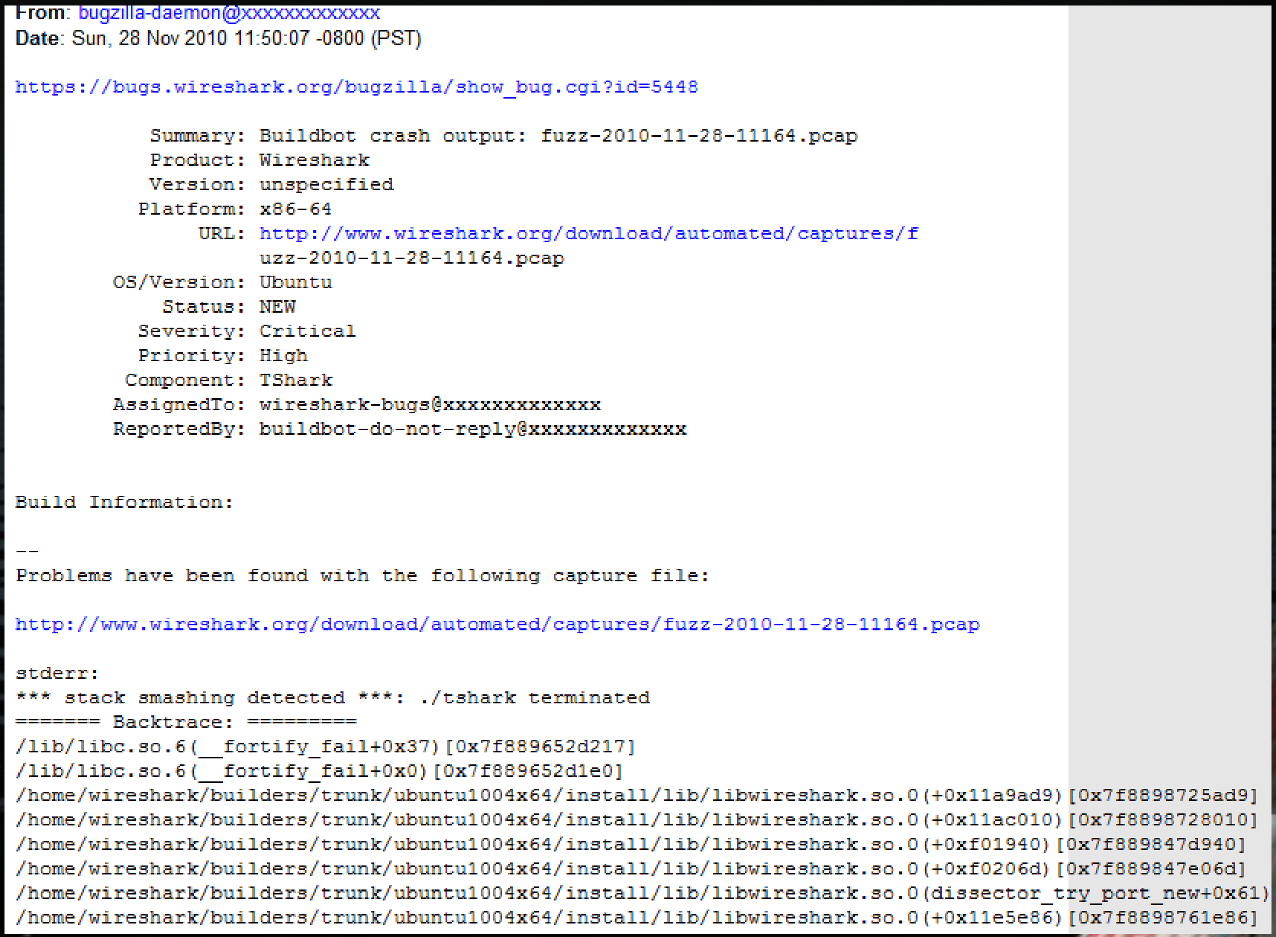
- Stack traces at no extra charge!



```
Wireshark on Fedora 14/x86_64 crashes when loading a capture that I've capture
on a XP/32 with 1.4.1

I can't provide the capture, but here's the stack. I may be able to get just
the offending packet - if I knew what it was:
#0  0x000000384b449612 in _IO_vfprintf_internal (s=<value optimized out>,
format=<value optimized out>, ap=<value optimized out>) at vfprintf.c:1561
#1  0x000000384b4faf30 in ___vsnprintf_chk (s=0x7fff76ad0abf "", maxlen=<value
optimized out>, flags=1, slen=<value optimized out>, format=
    0x7f522d73454a "(%s=%s)", args=0x7fff76ad0b20) at vsnprintf_chk.c:65
#2  0x000000384dc4a573 in vsnprintf (format=<value optimized out>, args=<value
optimized out>) at /usr/include/bits/stdio2.h:78
#3  g_printf_string_upper_bound (format=<value optimized out>, args=<value
optimized out>) at gmessages.c:1109
#4  0x00007f522c7d2749 in ep_strdup_vprintf (fmt=0x7f522d73454a "(%s=%s)",
ap=<value optimized out>) at emem.c:883
#5  0x00007f522c7d281d in ep_strdup_printf (fmt=<value optimized out>) at
emem.c:899
#6  0x00007f522cf39e1c in dissect_ldap_T_equalityMatch (implicit_tag=<value
optimized out>, tvb=<value optimized out>, offset=37,
    actx=<value optimized out>, tree=<value optimized out>, hf_index=<value
optimized out>) at ldap.cnf:536
#7  0x00007f522c8bf23b in dissect_ber_choice (actx=0x7fff76ad1450,
parent_tree=0x0, tvb=0x2a0ba40, offset=<value optimized out>, choice=
    0x7f522de37640, hf_id=35463, ett_id=9811, branch_taken=0x0) at
packet-ber.c:3013
#8  0x00007f522cf3b222 in dissect_ldap_Filter (tvb=0x2a0ba40, offset=0,
actx=0x7fff76ad1450, tree=0x0, hf_index=35463,
    implicit_tag=<value optimized out>) at ldap.cnf:686
#9  0x00007f522cf3b364 in dissect_ldap_T_and_item (implicit_tag=<value
```

Wireshark

- And fuzzers come for free!



From: bugzilla-daemon@xxxxxxxxxxxxx
Date: Sun, 28 Nov 2010 11:50:07 -0800 (PST)

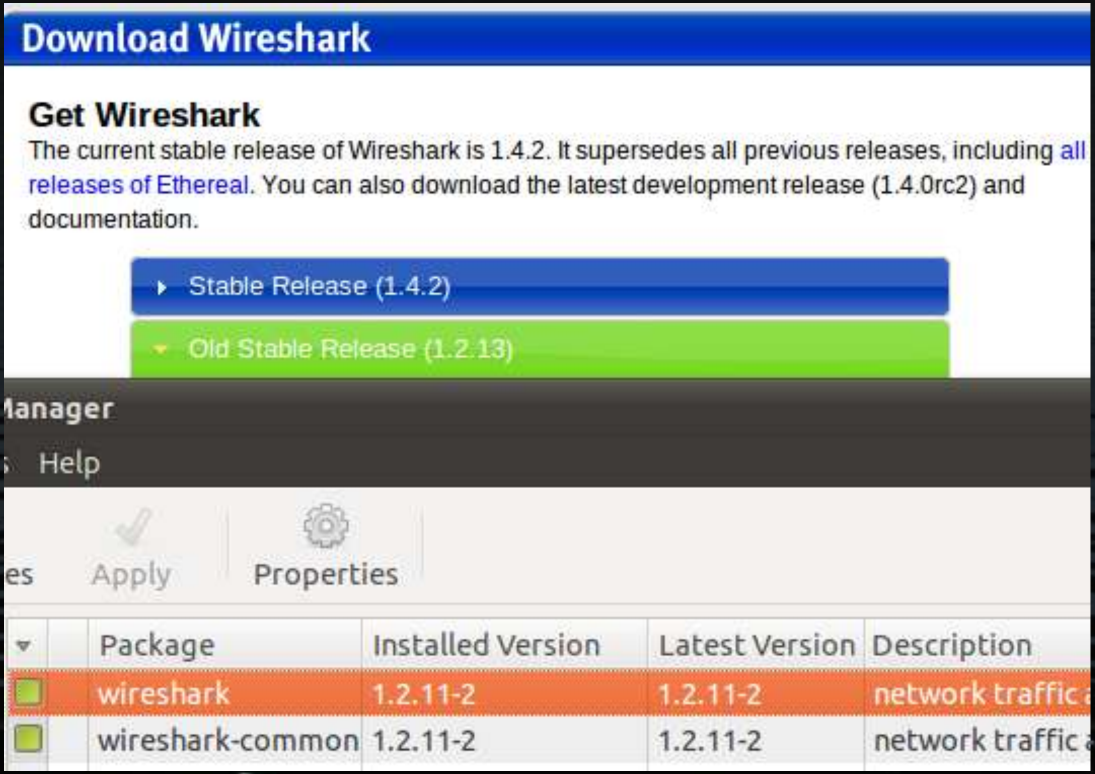
```
https://bugs.wireshark.org/bugzilla/show_bug.cgi?id=5448

           Summary: Buildbot crash output: fuzz-2010-11-28-11164.pcap
           Product: Wireshark
           Version: unspecified
          Platform: x86-64
               URL: http://www.wireshark.org/download/automated/captures/f
                    uzz-2010-11-28-11164.pcap
        OS/Version: Ubuntu
            Status: NEW
          Severity: Critical
          Priority: High
         Component: TShark
        AssignedTo: wireshark-bugs@xxxxxxxxxxxx
        ReportedBy: buildbot-do-not-reply@xxxxxxxxxxxx


Build Information:

--
Problems have been found with the following capture file:

http://www.wireshark.org/download/automated/captures/fuzz-2010-11-28-11164.pcap

stderr:
*** stack smashing detected ***: ./tshark terminated
======= Backtrace: =========
/lib/libc.so.6(__fortify_fail+0x37)[0x7f889652d217]
/lib/libc.so.6(__fortify_fail+0x0)[0x7f889652d1e0]
/home/wireshark/builders/trunk/ubuntu1004x64/install/lib/libwireshark.so.0(+0x11a9ad9)[0x7f8898725ad9]
/home/wireshark/builders/trunk/ubuntu1004x64/install/lib/libwireshark.so.0(+0x11ac010)[0x7f8898728010]
/home/wireshark/builders/trunk/ubuntu1004x64/install/lib/libwireshark.so.0(+0xf01940)[0x7f889847d940]
/home/wireshark/builders/trunk/ubuntu1004x64/install/lib/libwireshark.so.0(+0xf0206d)[0x7f889847e06d]
/home/wireshark/builders/trunk/ubuntu1004x64/install/lib/libwireshark.so.0(dissector_try_port_new+0x61)
/home/wireshark/builders/trunk/ubuntu1004x64/install/lib/libwireshark.so.0(+0x11e5e86)[0x7f8898761e86]
```

Wireshark

- Well, at least you can update

Wireshark

- Unless you can't



Download Wireshark

Get Wireshark

The current stable release of Wireshark is 1.4.2. It supersedes all previous releases, including all releases of Ethereal. You can also download the latest development release (1.4.0rc2) and documentation.

	Package	Installed Version	Latest Version	Description
🟩	wireshark	1.2.11-2	1.2.11-2	network traffic
🟩	wireshark-common	1.2.11-2	1.2.11-2	network traffic

Metasploit

Finding vulnerabilities - or - Why not fuzz?

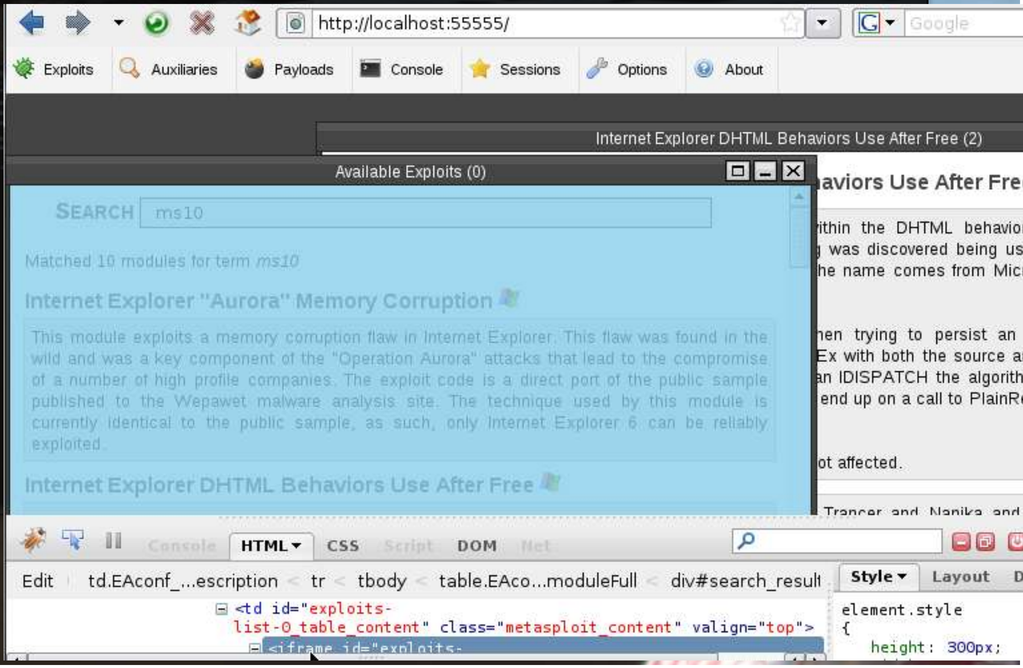
- Memory corruption
  - Openssl?
  - Ruby
- Logic errors

Web UI

- Things get more interesting
- Classic webapp attacks up for grabs
- Control of msfweb = control of metasploit
- Control of metasploit = control of system

Web UI Structure

- Frame based module launching
- Available Exploits -> Select Target -> Select Payload -> Options -> Launch
- Server is stateless
- Until launch
- /exploits/config
- post with options



Matched 10 modules for term *ms10*

Internet Explorer "Aurora" Memory Corruption

This module exploits a memory corruption flaw in Internet Explorer. This flaw was found in the wild and was a key component of the "Operation Aurora" attacks that lead to the compromise of a number of high profile companies. The exploit code is a direct port of the public sample published to the Wepawet malware analysis site. The technique used by this module is currently identical to the public sample, as such, only Internet Explorer 6 can be reliably exploited.

Internet Explorer DHTML Behaviors Use After Free

aviors Use After Fre
ithin the DHTML behavio
was discovered being us
he name comes from Mic
hen trying to persist an
Ex with both the source a
an IDISPATCH the algorith
end up on a call to PlainR
ot affected.
Trancer and Nanika and

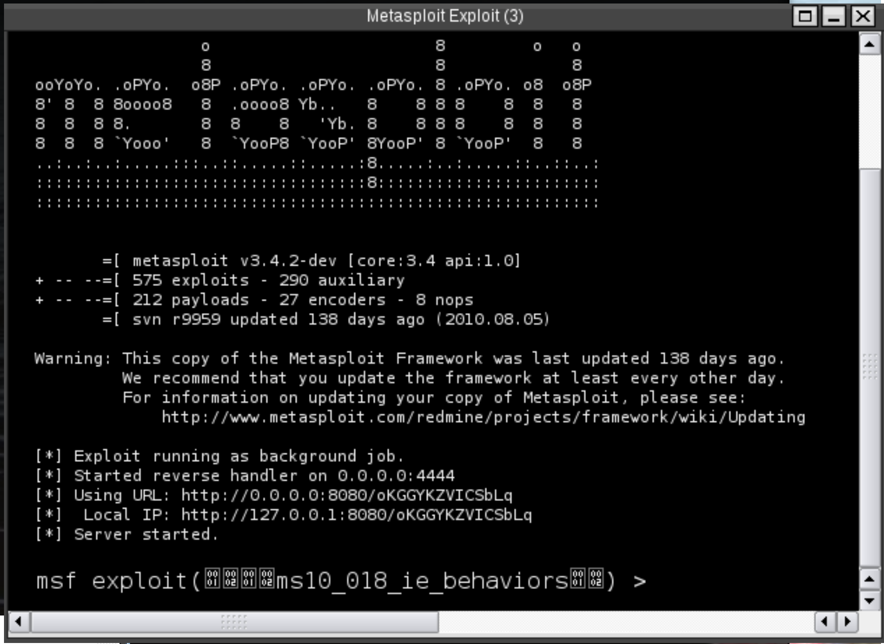
td.EAconf_...escription < tr < tbody < table.EAco...moduleFull < div#search_result

```
<td id="exploits-list-0_table_content" class="metasploit_content" valign="top">
  <iframe id="exploits-
```

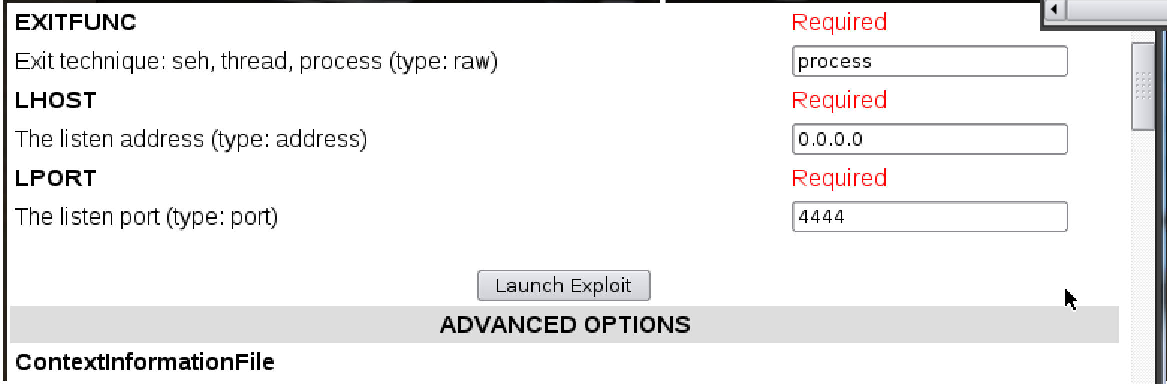
```
element.style
{
  height: 300px;
```

Web UI

- New console creation from module
- /console/index/0
- /console/index/1 …
- Request to /console manually creates
- Polls for output



```
                 o                       8         o   o
                 8                       8             8
ooYoYo. .oPYo.  o8P .oPYo. .oPYo. .oPYo. 8 .oPYo. o8  o8P
8' 8  8 8oooo8   8  .oooo8 Yb..   8    8 8 8    8  8   8
8  8  8 8.       8  8    8   'Yb. 8    8 8 8    8  8   8
8  8  8 `Yooo'   8  `YooP8 `YooP' 8YooP' 8 `YooP'  8   8
..:..:..:.....::..::.....::.....:8.....:..:.....::..::..:
::::::::::::::::::::::::::::::::::8:::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::::::::::::::::


       =[ metasploit v3.4.2-dev [core:3.4 api:1.0]
+ -- --=[ 575 exploits - 290 auxiliary
+ -- --=[ 212 payloads - 27 encoders - 8 nops
       =[ svn r9959 updated 138 days ago (2010.08.05)

Warning: This copy of the Metasploit Framework was last updated 138 days ago.
         We recommend that you update the framework at least every other day.
         For information on updating your copy of Metasploit, please see:
             http://www.metasploit.com/redmine/projects/framework/wiki/Updating

[*] Exploit running as background job.
[*] Started reverse handler on 0.0.0.0:4444
[*] Using URL: http://0.0.0.0:8080/oKGGYKZVICSbLq
[*]  Local IP: http://127.0.0.1:8080/oKGGYKZVICSbLq
[*] Server started.

msf exploit(□□□□ms10_018_ie_behaviors□□) >
```



EXITFUNC	Required
Exit technique: seh, thread, process (type: raw)	process
LHOST	Required
The listen address (type: address)	0.0.0.0
LPORT	Required
The listen port (type: port)	4444

ADVANCED OPTIONS

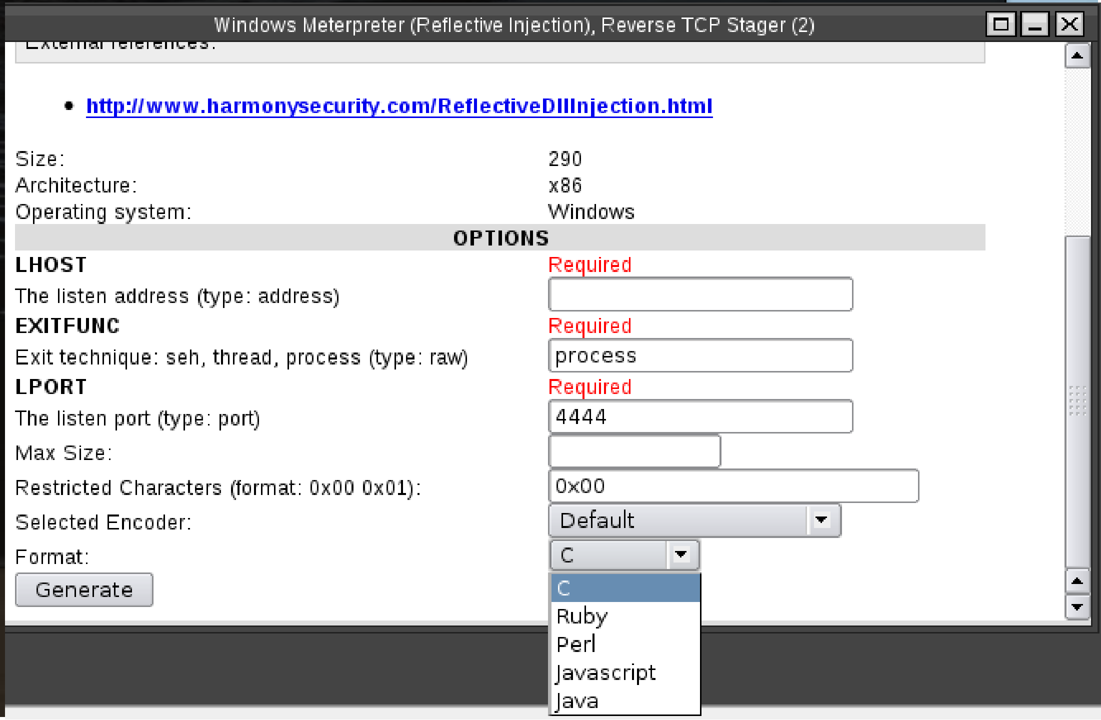
ContextInformationFile

Web UI Console

- Disabled commands
  - irb
  - System commands
- Reliability issues
  - Commands occasionally fail

Web UI Features

- Payload generation
- Frame sequence/option processing like exploits



Windows Meterpreter (Reflective Injection), Reverse TCP Stager (2)

External references:

- http://www.harmonysecurity.com/ReflectiveDllInjection.html

Size:	290
Architecture:	x86
Operating system:	Windows

OPTIONS

LHOST	Required
The listen address (type: address)	
EXITFUNC	Required
Exit technique: seh, thread, process (type: raw)	process
LPORT	Required
The listen port (type: port)	4444
Max Size:	
Restricted Characters (format: 0x00 0x01):	0x00
Selected Encoder:	Default
Format:	C

First Vulnerability

- Reflected XSS in payload generation
- Your encoded payload is displayed in a textarea
- Stars to align:
  - Payload must reflect arbitrary content (can't use normal shell/meterpreter payloads)
  - Encoder must generate predictable output (can't use most encoders, like shikata ga nai)
  - Format must preserve output (all listed formats only display hex of encoded payload)

XSS

- Payload cmd/unix/generic reflects arbitrary content
- Encoder generic/none leaves payload intact
- Payload format still works as a filter
  - Ruby, Java, Javascript, C arrays

XSS

- Unless you use an unlisted format
  - raw fmt + generic/none encoder + generic CMD payload = XSS

http://localhost:55555/payloads/view?badchars=&commit=Generate&encoder=generic%2Fnone&refname=cmd%3Aunix%3Ageneric&step=1&format=raw

  - Inserted into

<textarea> … </textarea>

  - XSS!

</textarea><script>alert(1)</script>

Vulnerability Impact

- No ; or = or , allowed
- Eval, String.fromCharCode first stage
- XSS console control
- Getting RCE
  - Command injection
  - Metasploit

Vulnerability Impact

- Getting RCE
  - Key command – loadpath
  - Downloading a file
    - Servers
    - Meterpreter

Meterpreter

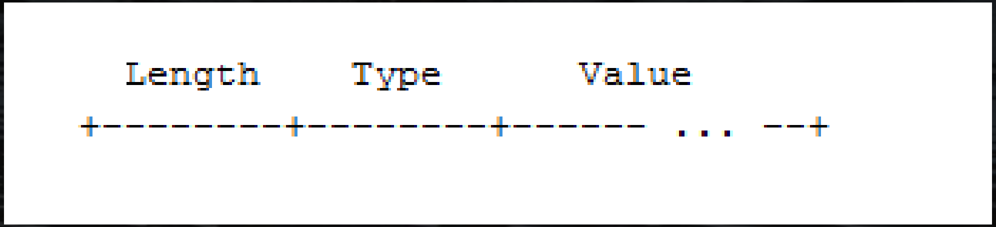
- Connection process
  - Stager connections
  - SSL
  - Initial request
  - Plugins
  - Command flow

Meterpreter

- Packet structure
  - TLV's

Meterpreter

- Packet structure
  - TLV's



```
   Length     Type       Value
+---------+---------+------  ...  --+
```

Meterpreter debugger

- View each TLV packet sent or received decoded
- Get all the information needed to emulate meterpreter calls

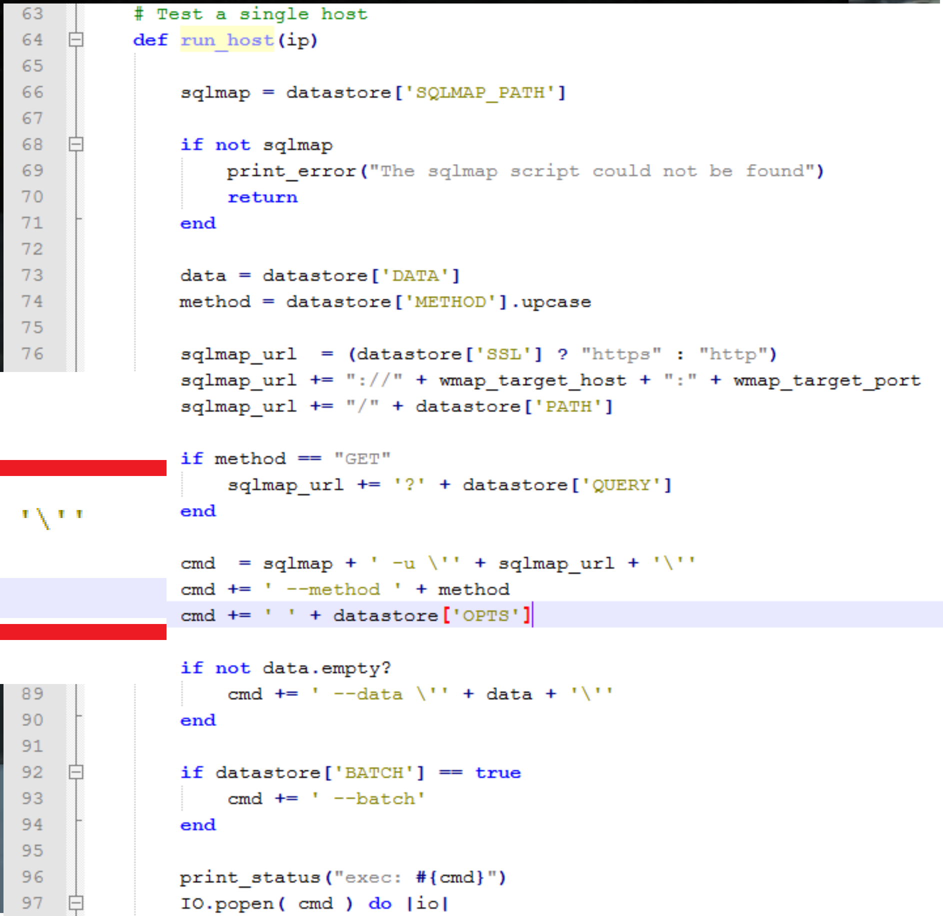
Exploit release

- XSS
  - Creates console
  - Launches meterpreter payload handler
  - Downloads ruby payload file
  - Loads ruby code
- Fake meterpreter to host shellcode
- Targets for all your favorite platforms

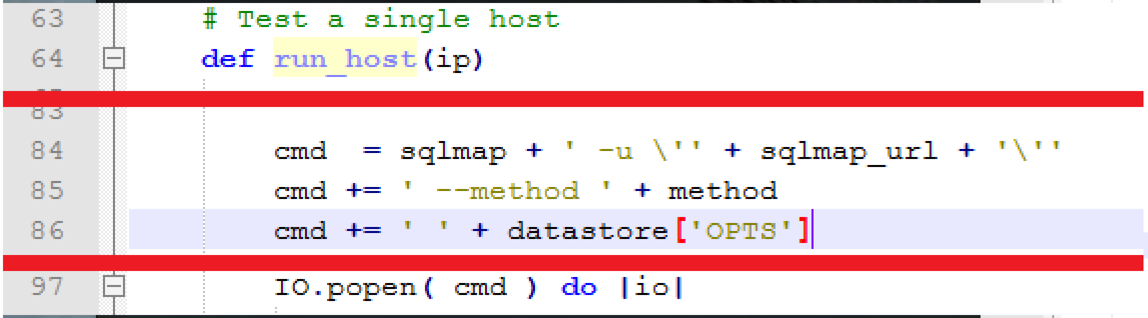
XSS Demo

Command Injection

- auxiliary/scanner/http/sqlmap
  - Is a special module
  - Options compose command line



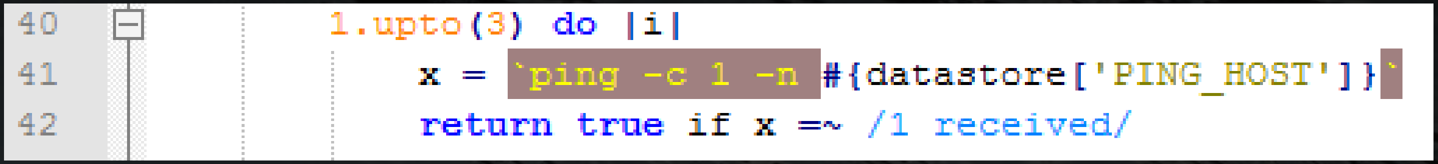
```
# Test a single host
def run_host(ip)

    sqlmap = datastore['SQLMAP_PATH']

    if not sqlmap
        print_error("The sqlmap script could not be found")
        return
    end

    data = datastore['DATA']
    method = datastore['METHOD'].upcase

    sqlmap_url  = (datastore['SSL'] ? "https" : "http")
    sqlmap_url += "://" + wmap_target_host + ":" + wmap_target_port
    sqlmap_url += "/" + datastore['PATH']

    if method == "GET"
        sqlmap_url += '?' + datastore['QUERY']
    end

    cmd  = sqlmap + ' -u \'' + sqlmap_url + '\''
    cmd += ' --method ' + method
    cmd += ' ' + datastore['OPTS']

    if not data.empty?
        cmd += ' --data \'' + data + '\''
    end

    if datastore['BATCH'] == true
        cmd += ' --batch'
    end

    print_status("exec: #{cmd}")
    IO.popen( cmd ) do |io|
```



```
# Test a single host
def run_host(ip)

    cmd  = sqlmap + ' -u \'' + sqlmap_url + '\''
    cmd += ' --method ' + method
    cmd += ' ' + datastore['OPTS']

    IO.popen( cmd ) do |io|
```

Command Injection

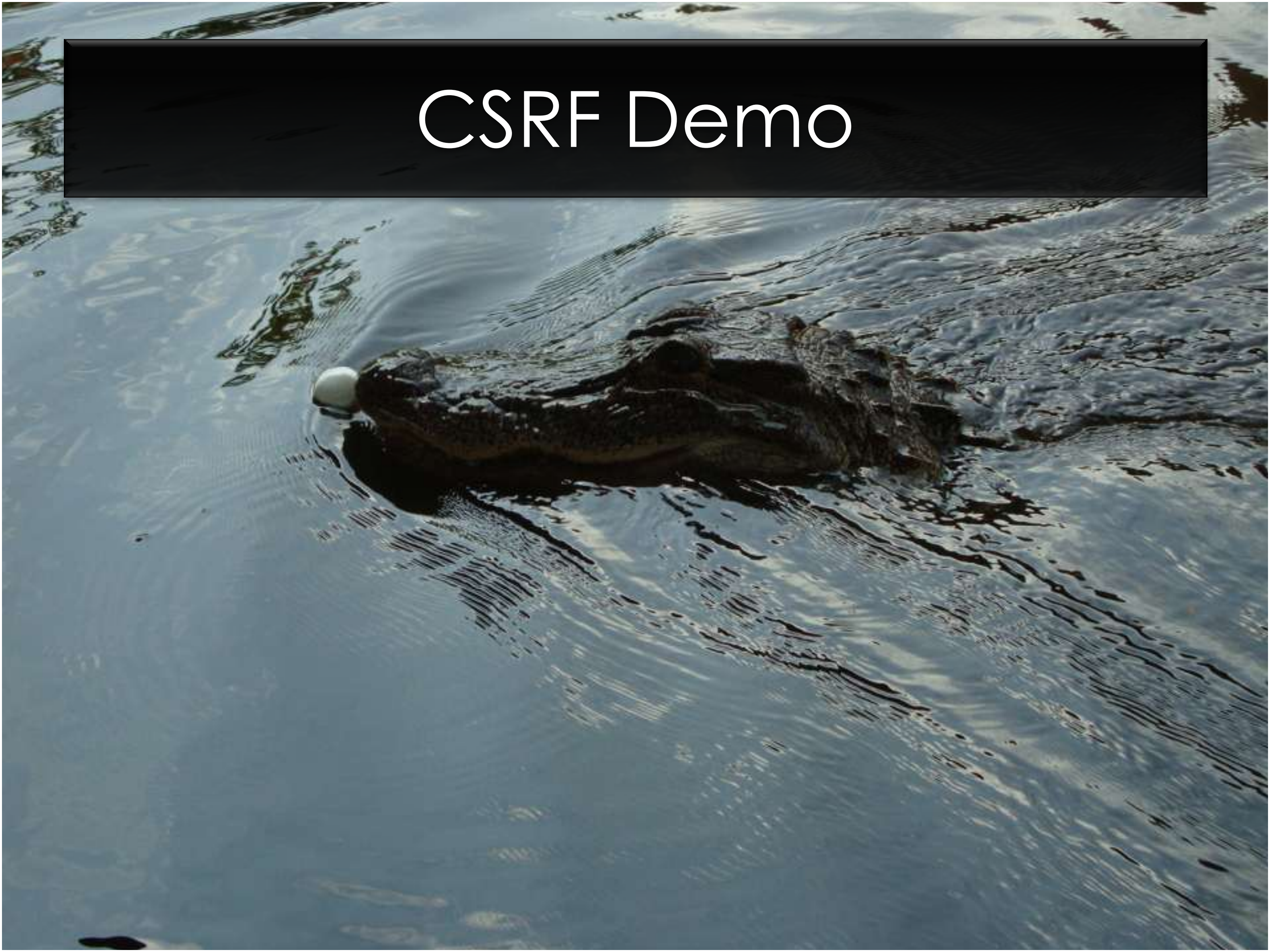
- Also have
  - auxiliary/fuzzers/wifi/fuzz_beacon.rb
  - auxiliary/fuzzers/wifi/fuzz_proberesp.rb



```
        1.upto(3) do |i|
            x = `ping -c 1 -n #{datastore['PING_HOST']}`
            return true if x =~ /1 received/
```

CSRF Vulnerability

- Input validation?
- CSRF
- Single-shot
- Generating a console
  - Finding a console
  - Reliable RCE metepreter-style difficult



CSRF Demo

Motivation

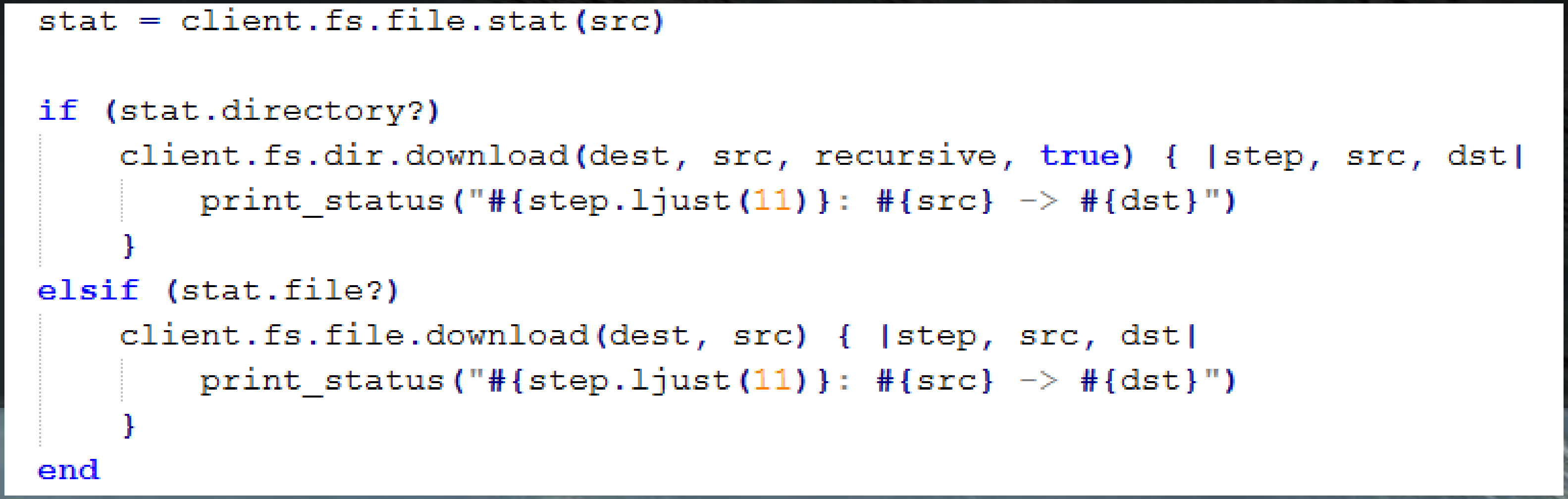
- I’m a Metasploit developer
- These were never patched
- Why release? Why not just fix the problems?
  - Maintainability
  - Disclosures

Meterpreter Vulnerability

- Meterpreter download process:

meterpreter> download foo

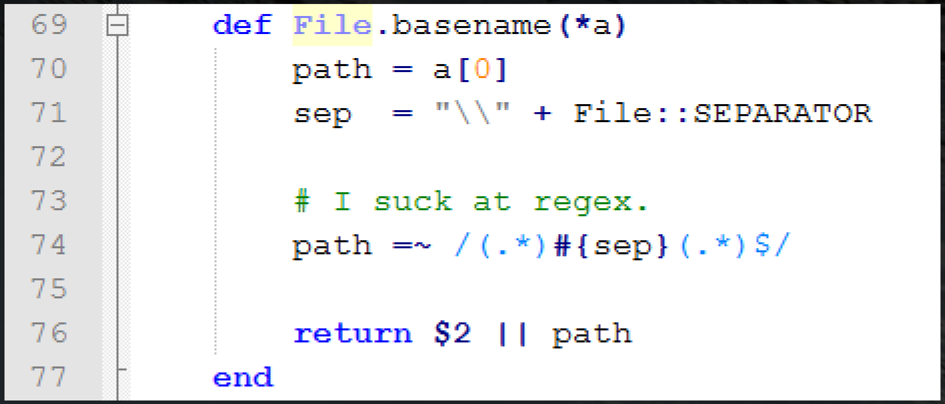
- In lib/rex/post/meterpreter/ui/console/command_dispatcher/stdapi/fs.rb



```
stat = client.fs.file.stat(src)

if (stat.directory?)
    client.fs.dir.download(dest, src, recursive, true) { |step, src, dst|
        print_status("#{step.ljust(11)}: #{src} -> #{dst}")
    }
elsif (stat.file?)
    client.fs.file.download(dest, src) { |step, src, dst|
        print_status("#{step.ljust(11)}: #{src} -> #{dst}")
    }
end
```

Meterpreter Vulnerability

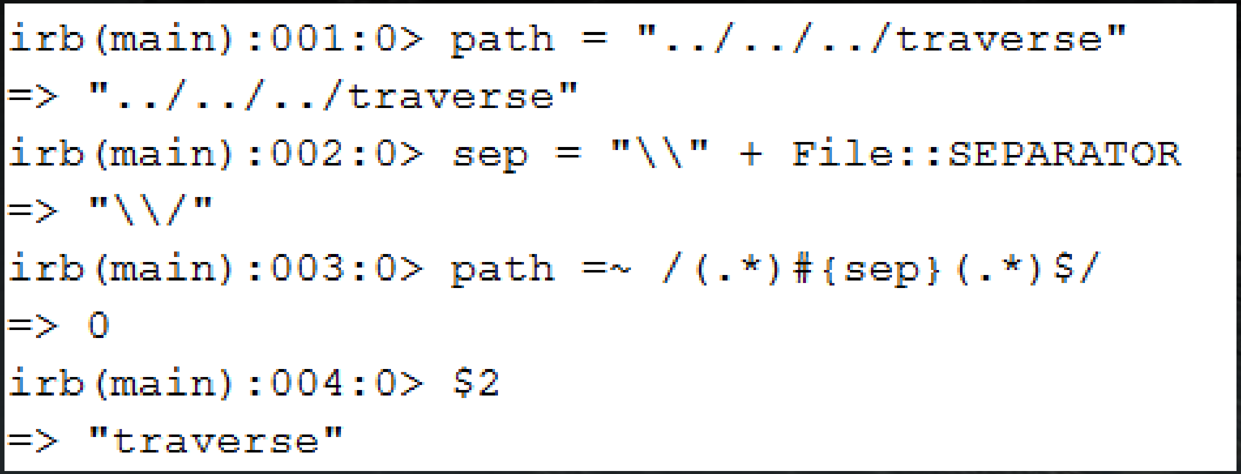
- File is saved as its basename
- In lib/rex/post/meterpreter/extensions/stdapi/fs/file.rb



```
def File.basename(*a)
    path = a[0]
    sep  = "\\" + File::SEPARATOR

    # I suck at regex.
    path =~ /(.*)#{sep}(.*)$/

    return $2 || path
end
```

Meterpreter Vulnerability

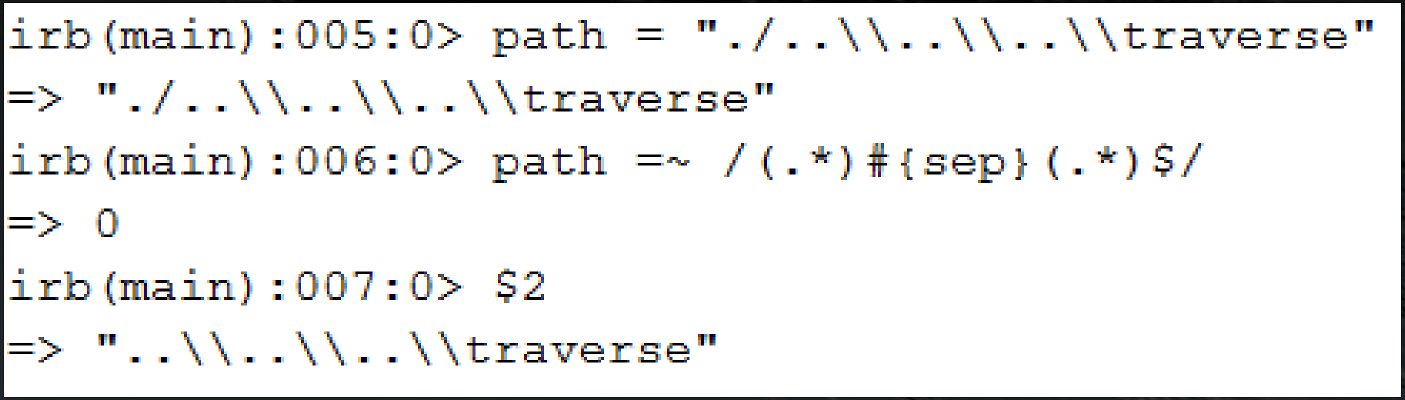
- Filtering out directory traversal



```
irb(main):001:0> path = "../../../traverse"
=> "../../../traverse"
irb(main):002:0> sep = "\\" + File::SEPARATOR
=> "\\/"
irb(main):003:0> path =~ /(.*)#{sep}(.*)$/
=> 0
irb(main):004:0> $2
=> "traverse"
```

Meterpreter Vulnerability

- ~~Filtering out~~ directory traversal
- File::SEPARATOR == "/" even on Windows!



```
irb(main):005:0> path = "./..\\..\\..\\traverse"
=> "./..\\..\\..\\traverse"
irb(main):006:0> path =~ /(.*)#{sep}(.*)$/
=> 0
irb(main):007:0> $2
=> "..\\..\\..\\traverse"
```

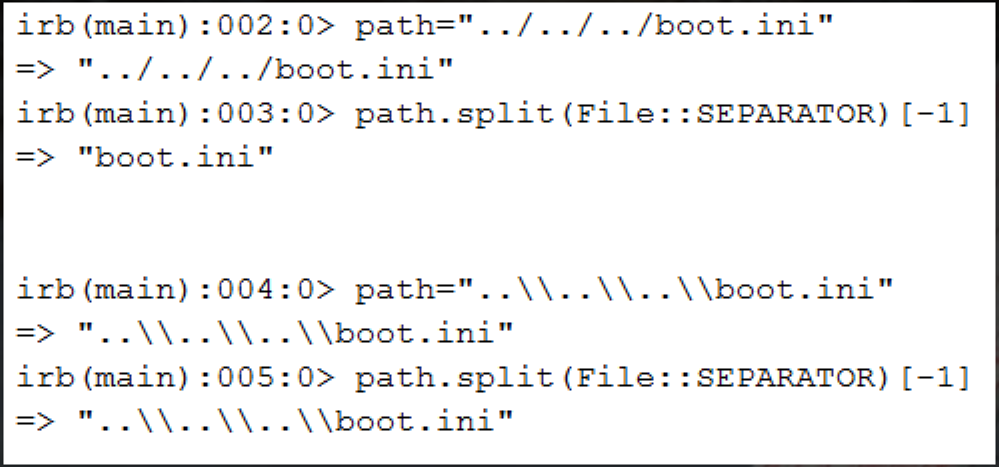
Meterpreter Vulnerability

- But nobody’s going to type “download ./..\\..\\..\\evil”
- But they might type “download juicydirname”
- Directories will take children with them

Meterpreter Traversal Demo

TFTP server

- Getting basename for file upload:
  - tr[:file][:name].split(File::SEPARATOR)[-1]



```
irb(main):002:0> path="../../../boot.ini"
=> "../../../boot.ini"
irb(main):003:0> path.split(File::SEPARATOR)[-1]
=> "boot.ini"


irb(main):004:0> path="..\\..\\..\\boot.ini"
=> "..\\..\\..\\boot.ini"
irb(main):005:0> path.split(File::SEPARATOR)[-1]
=> "..\\..\\..\\boot.ini"
```

TFTP Traversal Demo

FTP server

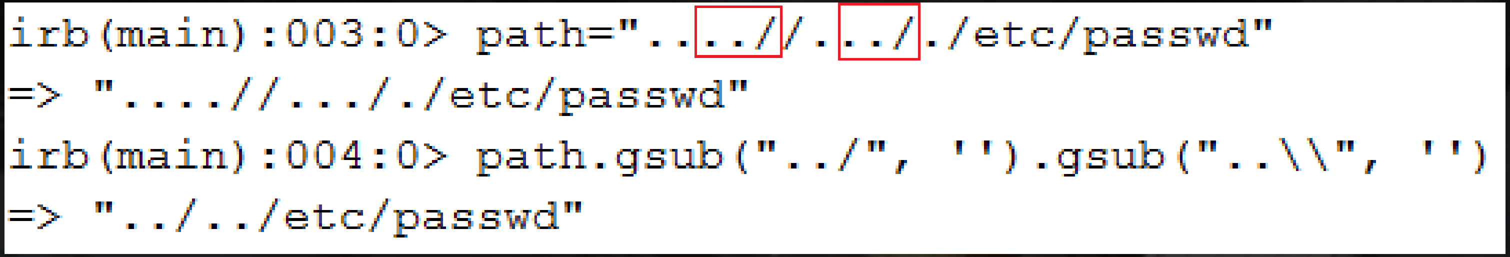
- Directory traversal filtering

```
path = ::File.join(datastore['FTPROOT'], arg.gsub("../", '').gsub("..\\", ''))
```

```
irb(main):001:0> path="../../../etc/passwd"
=> "../../../etc/passwd"
irb(main):002:0> path.gsub("../", '').gsub("..\\", '')
=> "etc/passwd"
```

FTP server

- Directory traversal filtering



```
irb(main):003:0> path="....//..././etc/passwd"
=> "....//..././etc/passwd"
irb(main):004:0> path.gsub("../", '').gsub("..\\", '')
=> "../../etc/passwd"
```

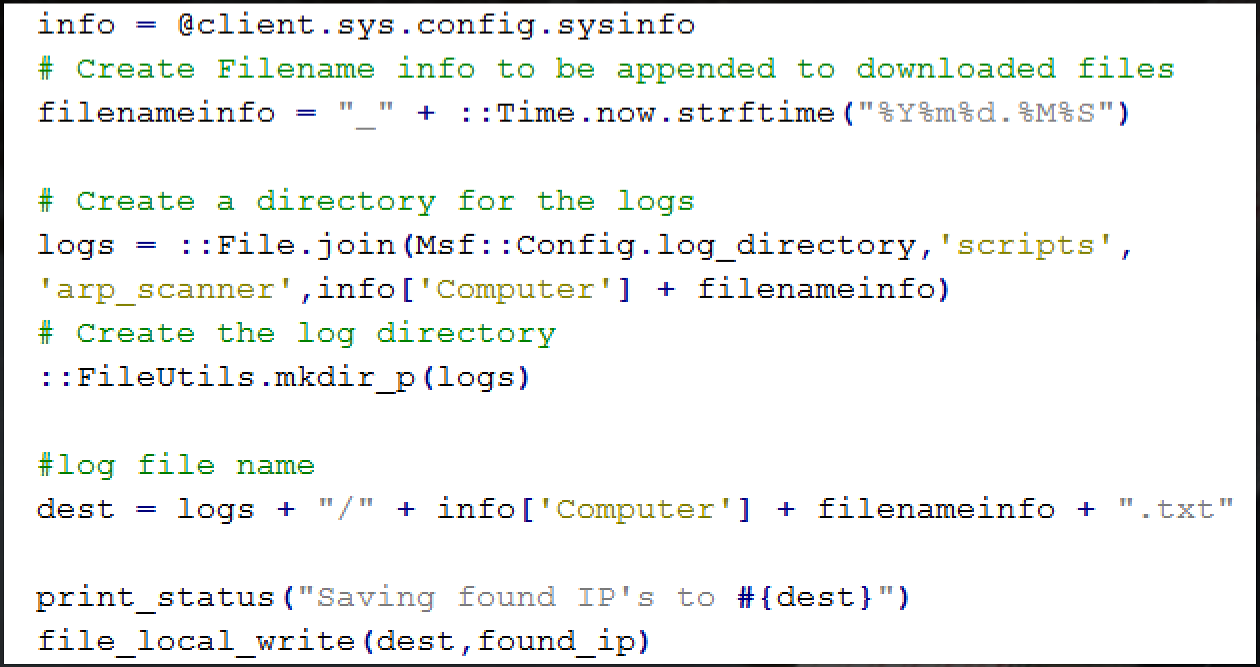
Irony

- titanftp_xcrc_traversal.rb
- FTP traversal exploit with CRC brute force
- Byte-by-byte decode via XCRC command

FTP Traversal Demo

Scripts

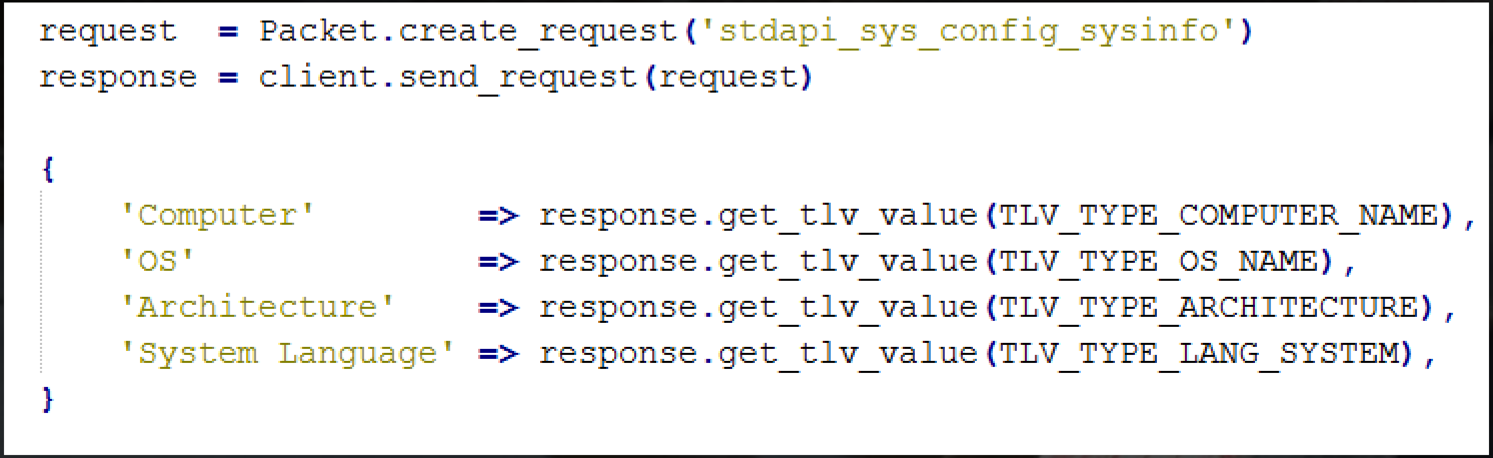
- Often use client system name for log files



```
info = @client.sys.config.sysinfo
# Create Filename info to be appended to downloaded files
filenameinfo = "_" + ::Time.now.strftime("%Y%m%d.%M%S")

# Create a directory for the logs
logs = ::File.join(Msf::Config.log_directory,'scripts',
'arp_scanner',info['Computer'] + filenameinfo)
# Create the log directory
::FileUtils.mkdir_p(logs)

#log file name
dest = logs + "/" + info['Computer'] + filenameinfo + ".txt"

print_status("Saving found IP's to #{dest}")
file_local_write(dest,found_ip)
```

Client system name

- Straight from not-to-be-trusted network data



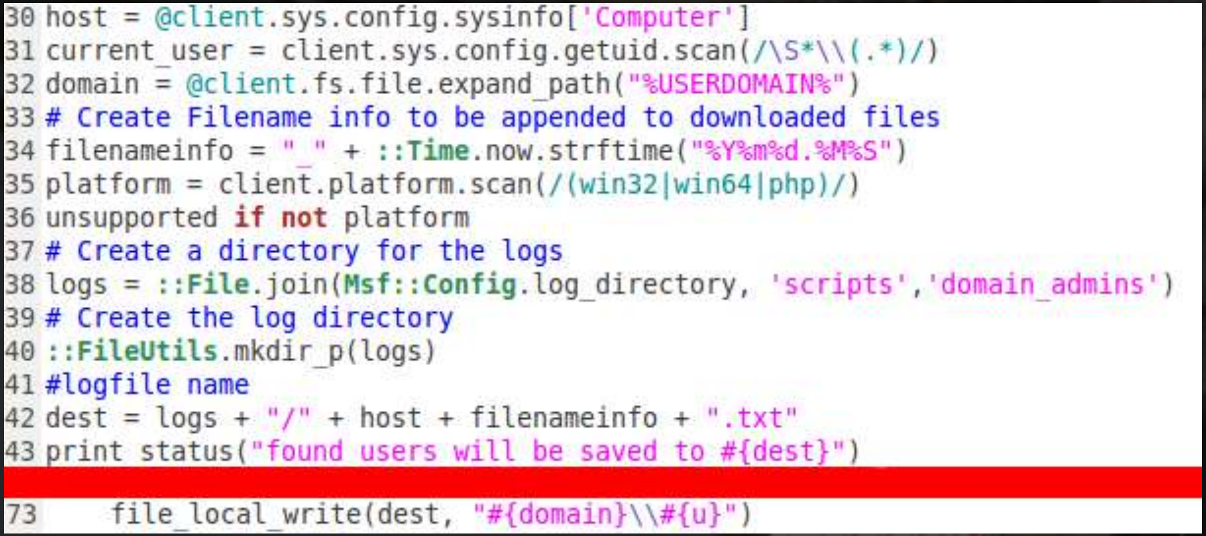
```
request  = Packet.create_request('stdapi_sys_config_sysinfo')
response = client.send_request(request)

{
    'Computer'        => response.get_tlv_value(TLV_TYPE_COMPUTER_NAME),
    'OS'              => response.get_tlv_value(TLV_TYPE_OS_NAME),
    'Architecture'    => response.get_tlv_value(TLV_TYPE_ARCHITECTURE),
    'System Language' => response.get_tlv_value(TLV_TYPE_LANG_SYSTEM),
}
```

Scripts

- arp_scanner, domain_list_gen, dumplinks, enum_chrome, enum_firefox, event_manager, get_filezilla_creds, get_pidgin_creds, packetrecorder, persistence, search_dwld, winenum

domain_list_gen

- Counterattack can save file in arbitrary directory relative to home dir
- Starting with arbitrary contents



```
host = @client.sys.config.sysinfo['Computer']
current_user = client.sys.config.getuid.scan(/\S*\\(.*)/)
domain = @client.fs.file.expand_path("%USERDOMAIN%")
# Create Filename info to be appended to downloaded files
filenameinfo = "_" + ::Time.now.strftime("%Y%m%d.%M%S")
platform = client.platform.scan(/(win32|win64|php)/)
unsupported if not platform
# Create a directory for the logs
logs = ::File.join(Msf::Config.log_directory, 'scripts','domain_admins')
# Create the log directory
::FileUtils.mkdir_p(logs)
#logfile name
dest = logs + "/" + host + filenameinfo + ".txt"
print_status("found users will be saved to #{dest}")
```

```
    file_local_write(dest, "#{domain}\\#{u}")
```

Lame DoS attacks

- Exploit handlers without ExitOnSession
- Meterpreter memory exhaustion
- Disk exhaustion: never-ending download

Writing Payloads

- Cross-platform RCE
  - Ruby is your friend
  - All msf libraries available for use
  - Can embed platform-specific or java payloads

Payloads

- New thread spinoff
- Multithreaded bind shell with error recovery
- Reverse shell with error handling

Wireshark Payloads

- Hard to do cross-platform
- Hard to do exploits cross-platform too
- Memory layouts, heap structures, system calls…

Persistence

- ~/.msf3/modules/exploits/
  - Loaded on metasploit start, writeable by current user
  - Or payloads, auxiliary, encoders, nops
  - Ruby!
- ~/.msf3/msfconsole.rc
  - Quasi-undocumented autorun resource file
  - Embeds ruby

Persistence

- Add something to main msf3 folder
  - /opt/metasploit3/msf3
  - C:\framework\msf3
- Relocate tree!
  - svn switch

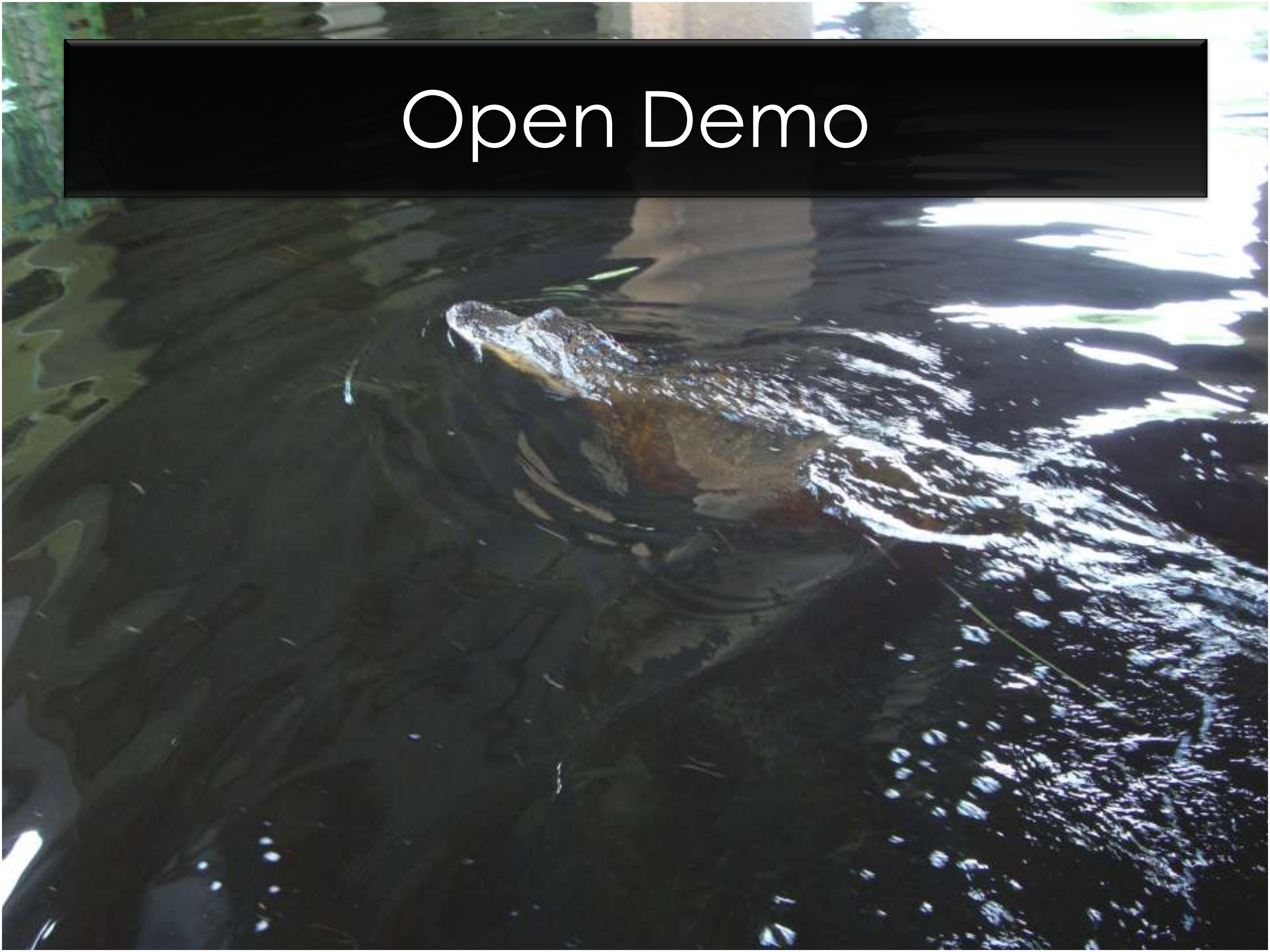
Defenses

Defenses

- Developers/script writers
  - Don’t trust input from the network
  - Don’t trust client-side validation
  - Just because it looks like you control them doesn’t mean it’s true
- Users
  - Update!
- Limit privileges if possible
  - HTTP, SMB, DHCP, FTP, DNS, TFTP servers in Metasploit may require root
  - Most Nmap scans require root

Defenses

- Virtualization
  - Because VMs work
  - Saves privilege issues
  - Probably doesn’t work with lorcon modules & raw wireless exploits
- OS choice



Open Demo

Wrap up

- Summary
- Lessons learned
- Products not shown here

Questions

```
       =[ metasploit v3.3.4-cyberwarfare [core:3.3 api:1.0]
+ -- --=[ 539 exploits - 260 auxiliary
+ -- --=[ 265 payloads - 23 encoders - 8 nops
       =[ svn r8974 updated today (2010.04.01)

msf > 
```