Black Hat DC 2010

Metasploit

ADVANCED COMMAND INJECTION EXPLOITATION:

cmd.exe in the 00's

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Affiliated Computer Services
Penetration Tester
www.acs-inc.com

Metasploit

Develop Codes for stuff
www.metasploit.com

Command Injection

Definition

Command injection is an attack method in which a hacker alters dynamically generated content on a Web page by entering HTML code into an input mechanism, such as a form field that lacks effective validation constraints. A malevolent hacker (also known as a cracker) can exploit that vulnerability to gain unauthorized access to data or network resources. When users visit an affected Web page, their browsers interpret the code, which may cause malicious commands to execute in the users' computers and across their networks.

Command Injection

Uhm…

Really???

Command Injection

Definition

An attack technique used to take advantage of a vulnerability which results in the execution of operating-system commands.

Command Injection

Our Focus

OS Command Injection (to be specific)

Windows Operating Systems

Less useful toolset to work with compared to UNIX, Linux, etc.

Harder to work with post exploitation

Command Injection

Examples

CVE-2009-3845 – HP OpenView NNM Perl CGI

CVE-2008-5516 – gitweb common repository web interface used by open source projects

CVE-2007-3670 – The infamous IE FirefoxURL protocol handler bug Spawned many related issues

Command Injection

Current Exploits

Typically a low level of sophistication

Most are for Unix/Linux environments

Most use network related commands for file transfer, etc

Command Injection

Exploitation Considerations

Some Operating Systems only offer a small set of commands

Command length limits

XP / Win2k3 / Vista	8191b
Win2k	2047b
Win95 / 98	256b

Blind injections

Command Injection

Exploitation Considerations

Commands available on all Operating System targets

Common command flags

Writable/Executable directories

Metacharacter Filters

Command Injection

Going Beyond Simple Commands

Upload binary payloads

Gives us more options

More features

Meterpreter FTW!!!

Command Injection

Network Fu

FTP/TFTP

WScript

Fileshares

Mount Remote Drives

rcp

Command Injection

Pros

Fast downloads

Easily scripted

Low Overhead (no encoding needed)

Command Injection

Cons

Firewalls

Web Filters

Reliability

Command Injection

Non-network Fu

Debug.exe (Not supported on Windows Vista/7)

WScript

  Scripting.FileSystemObject

batch2binary

Command Injection

Pros

- Use existing connection
- Bypasses firewalls
- Works in harsh environments

Command Injection

Cons

Slower downloads (need to use buffering to prevent errors)

Complex scripting

Overhead (binary to ASCII conversion)

Command Injection

Designing a Command Stager

Must be reliable

Capable of sending any potential payload

Reuse existing connections (bypass firewalls)

Clean up after itself (Non-persistent)

Stream buffering of data

Reasonably fast

Command Injection

Binary to ASCII Conversion

Could use base64

ASCII representation of hex (0x35 = 0x33 0x35)

Ruby: hex = exe.unpack("H*")[0]

Many options

Command Injection

OS Detection

We can use ‘If exists’ to detect the OS

Check for debug.exe (XP or prior)

Echo a 2048 byte long line to a file (XP)

Echo a < 2048 byte long line to a file (Win2k or prior)

Boot.ini grep/find for a string (XP and prior)

Command Injection

Using Covert Channels

Ping.exe can be used to send messages fairly reliably

Even the harshest of environments typically allow outgoing ICMP

We can use packet size as our status indicator

Using the number of packets to send is overkill

Command Injection

Plan of Attack

The most reliable option is Non-Network Fu

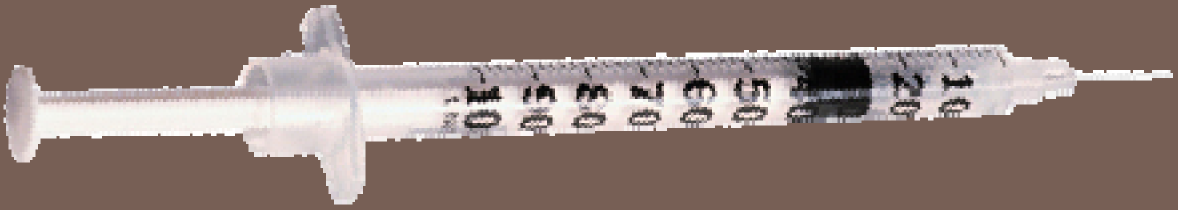
WScript decoder stub (decode a base64 encoded file)

Drop the payload as an executable file and run it

Reverse TCP connections are probably best (Reverse TCP All ports even better)

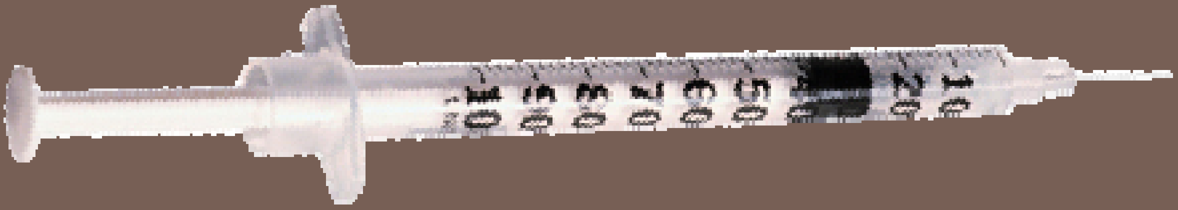
Command Injection

Demo time !



Command Injection

Code review



Command Injection

Meterpreter FTW!

An agent which provides a lot of post exploitation capabilities

Dump Hashes

Upload/Download files

Pivoting

Local Privilege Escalation

Command Injection

Conclusion

Current command injection exploitation techniques are lacking

Reusing existing connections more reliable

WScript is on all windows operating systems

Meterpreter Rocks for post exploitation!

Command Injection

Questions？