Covert Post-Exploitation Forensics with Metasploit

Wesley McGrew
McGrewSecurity.com

Mississippi State University
National Forensics Training Center
From the DEF CON 19 CFP:

- James Bond Man from U.N.C.L.E. type spy stuff.

Okay, let’s get sneaky...
Covert

• without the subject’s knowledge

Post-Exploitation

• after a remote compromise, local backdoor

Forensics

• reconstructing data above and beyond what the subject anticipates
Forensics and penetration testing/other offensive operations
For the forensics geeks...

No subject location, no problem

Surreptitious acquisition and analysis

Familiar tools...
For the penetration testing geeks...

Potential for more important data gathered per compromised system

“We don’t keep that data”

Multiple revisions of files, old data

Data carving

General purpose scripting

Stealthy!
Typical Forensics Examination Scenarios

- Hardware seizure
- Authorized software agents
- On-site
- “Suspect”/Subject is aware
Covert Remote Forensics

• Unaware Subject
• No known physical location?
  • Not a deal-killer.
• Remote imaging
• Remote block device access
Ears perking up yet?

- Intelligence
- Penetration testers upping post-exploitation game
- Compliance
- Criminal
Forensics for people who break things

Semester-long class

Week-long LE Courses

Talk to Pentesters
File System Forensic Capabilities

- Allocated files
- Deleted files
- Slack space
  - Disk/Volume
- Unallocated space
- Deletion vs. Formatting vs. Wiping
- Imaging
Slack Space Example

Sector size: 512 bytes
Cluster size: 4 sectors
File size: 4150 bytes

RAM Slack (probably 0'd)

Disk Slack (potential goodies)
Can’t I do this already?

- Load sleuth kit up onto the compromised target?
- Probably will work but...
  - ...stomping on deleted files
  - ...not that stealthy
  - ...a little less slick than what I’m proposing:
Enter Railgun

• “Patrick HVE” - Are you out there? Massive thanks!

Railgun is an extension for Meterpreter Ruby. It allows you to use the complete Windows API on the meterpreter-controlled system. You can call any function of any DLL you may find or upload to the target system.
If we can call Windows API remotely...

• ...then we can access physical/logical block devices directly

• ...which means we can read arbitrary sectors from the disk

• ...why not map remote block devices to local ones?
Metasploit Post Modules

- `enum_drives.rb`
  - Helper/Support

- `imager.rb`
  - byte-for-byte imaging
  - Hashing
  - Split images
  - Cool, but........
nbd_server.rb!

- Run forensic tools locally, on local block devices that are mapped to remote block devices!
- API calls made over meterpreter shell
- NBD (Network Block Device)
  - Easy way to get programmatic block devices in Linux
- Read-only (forensic write-blocking)
- Direct remote access with off-the-shelf/commercial/open-source tools
Attacker
Forensic Tools

/dev/nbd0
nbd
Metasploit

Meterpreter

Win API
Disk
Target

To o l s

nbd
Metasploit

Meterpreter

Win API
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Forensic Tools

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To o l s
Stupid Protocol Tricks

iSCSI

NBD

Meterpreter/Railgun

Windows API

Disk
Caveats and exercises for the reader

• Network
• Speed
• Stealth
• Cleaner/cross-platform implementation
• Pure ruby iSCSI?
Conclusions

• Go and wring more data out of systems!
• Builds capability for forensic examiners and penetration testers
• Encourage secure wiping
Demos