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Digital Deception:
Raising the Stakes on Hackers

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Overview

- **Changes in hacker space**
- **Weather & early warning systems**
- **Dirty deeds done dirt cheap**
- **Big freakin' haystack introduction**
  - **Emulation of 16 million node network**
  - **Intrusion Management network**
- **What next?**
- **Q&A**

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Goals…

- **Use of Digital Deception**
- **Confuse, Harass, Confound the enemy**
- **Dramatically, drastically, overwhelmingly increase the economic cost of system scanning and worm target acquisition**
- **Make script kiddy and worms infeasible**
- **Force a paradigm shift**

We are locked in a cold-war arms race, where only the arms dealer wins.

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Internet attacks have changed…

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Old school attack

- **Lone interloper targets major firm**
- **Studies publicly available information**
- **Hangs out at local pub, befriends sales team**
- **Dumpster dives to obtain manuals, phone lists**
- **Uses war-dialer to find modems & remote hosts**
- **Uses social engineering to obtain passwords**
- **Dials up hosts, logs in, mayhem & mischief**

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"Modern" attack

- **Lone interloper targets IP range**
- **Downloads script kiddy tools**
- **Scans IP range looking for vulnerable hosts**
- **Port scans hosts looking for exploitable services**
- **Uses exploit tool, mayhem & mischief**

Target selection now a target of opportunity… indiscriminate attack

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Confuse and harass attackers

Make your real servers look bogus

- **Save all .ASP code as .CGI files, perl as .ASP**
- **Configure responses from Apache that mimic IIS**
- **Open dummy NetBIOS ports on Unix servers**
- **Open bogus 21, 23, 25, 80 & 443 ports on all servers, with netcat listening on the bogus ports**
- **Call your database server "Firewall"**
- **Route bogus traffic to IDS network**

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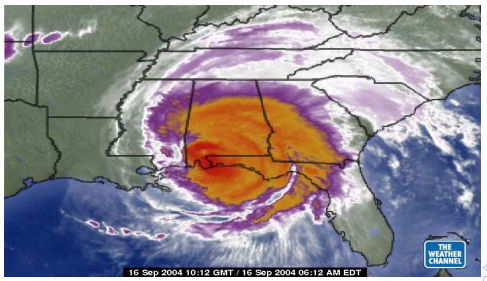
Worms hit 10,000 networks at once…



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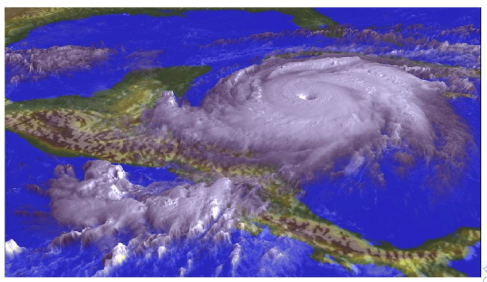
What we need is early warning



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Hide in the open: Big freakin' haystack

- **Virtual honeynets + Intrusion Management**
- **Create server that emulates address range: 10.x.x.x**
- **Open tons of ports: 20, 21, 23, 25, 37, 42, 43, 49, 67, 68, 69, 80, 109, 110, 137-139, 389, 443, 666, 6667**
- **Emulate good hosts: MS-Exchange, Solaris/Oracle, MS-SQL, RedHat/Apache/Tomcat, WinXP Pro**
- **Emulate bad boxes: botnet servers, Warez server, trojaned workstations, Win95 workstation, backdoor**
- **Honeyd likely tool, or at least a starting point**

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Hide in the open: Big freakin' haystack

- **Convert unused address space into decoy tripwire nets - 16,320,000 decoys to 200 "real" servers**
- **Stop swallowing packets: route unreachable hosts to the virtual honeynet**
- **190,000 decoys per "real" server = 99.9995% detection**
- **Any hits are malicious – route to IDS / IPS**
  - **Research attack profile**
  - **Throttle attack / drop packets**
  - **Block attackers for 1 hour, 2 hours, 24 hours, 1 week**
- **You've gained breathing room to respond to real attacks**

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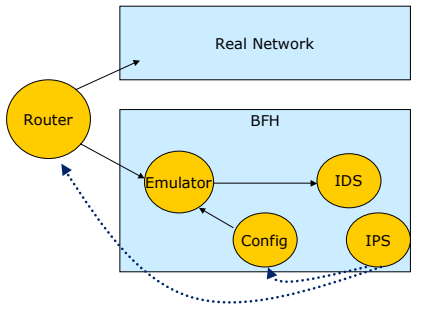
Hide in the open: Big freakin' haystack



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Security through obscurity?

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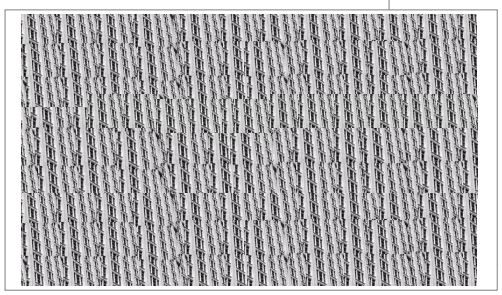
Hide in the open



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The fun has just begun…

LaBrea: SYN/ACK, TCP Window size = 0 (wait)

- **Use Tarpit to freeze a scan, run on random port**
- **Freezes Windows-based scanners up to 4 minutes**
- **Change window size to vary randomly, 0-15**
- **Scanning 10,000 hosts takes 27 days.**
- **Detecting 100 unpublished hosts in Class B network would take approximately 110 days**
- **Detecting 100 unpublished hosts in Class A would take approximately 112 years**

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The fun has just begun…

Storm Surge Mode**: active re-configuration**

- **Suppose your "standard" BFH net emulates:**
  - **25% Apache/Tomcat on RedHat 7**
  - **25% Win2003 / SQL-Server**
  - **25% Lotus Notes/Domino on Win2k Server**
  - **25% Oracle 9i on Solaris**
- **IDS telemetry reports spike in Win2k attacks**
- **BFH configuration changes:**
  - **30% Win2000 / SQL 6.5**
  - **30% Win2000 / Exchange**
  - **30% Win2000 / IIS**
  - **10% Allocated among 30 other server/workstation images**

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The fun has just begun…

- **Virtual honeynets: Make legitimate servers look like bogus servers**
- **Make all servers (fake & real) look identical**
- **BFH in your internal network**
  - **Malware outbreaks see your network with 16 million hosts**
  - **Ability to detect worms while slowing spread by 600x**
- **Simulate sendmail open relays – Death to spam!!**
- **If all Class A, B & C networks ran BFH:**
  - **Emulation of 12,493,209,429,306 bogus hosts**
  - **Port scans & profiling a thing of the past**
- **Worms and script kiddies would be economically infeasible**

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Where do we go from here?

- **Tactical changes**
- **Strategic changes**
- **Open source vs. commercial**
- **Platform**
- **Network changes?**
  - **Firewall, router, switch, smart-switch, blades**
- **Unintended consequences: little guys get beat up**
- **Interactive, collaborative BFHnet**
- **Do we even NEED a firewall anymore, with BFH?**

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Summary

- **Stop script kiddies for $30k, seems like reasonable ROI**
- **Imagine if every class A, B & C network ran BFH**
  - **Emulation of 12,493,209,429,306 bogus hosts**
  - **Port scanning infeasible, profiling a moot point**

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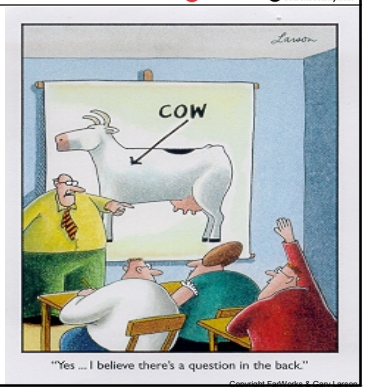
Q&A



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Contact Information

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Further info:

"Submarine Warfare", August 2003 issue of Information Security Magazine:

http://infosecuritymag.techtarget.com

Big Freakin' Haystack Initiative:
http://sourceforge.net/projects/bfhi

Some images courtesy of The Weather Channel, NASA.
Trogdor the BURNiNATOR image courtesy homestarrunner.com