

Kevin Cardwell



BLACK HAT BRIEFINGS

Toolkits: All-in-One Approach to Security

This talk will be on using toolkits for your pen-testing, vulnerability assessment etc. Configuring a plethora of the different tools out there can be quite time consuming, and challenging. The focus of this talk will be to look at an alternative solution that provides a suite of tools at boot. Until recently there was not very many toolkits, and the ones that were there did not work very well, that has changed and in this talk I will discuss the toolkits available, and demo one of the better ones. The toolkits that will be reviewed will all be open source, and free, there are commercial solutions available, but why pay when the free ones are more than adequate.

Kevin Cardwell spent 22 years in the U.S. Navy, starting off in Sound Navigation and Ranging (SONAR). He began programming in 1987. He was fortunate enough to get on the Testing Team and got to test and evaluate Surveillance and Weapon system software including; Remote Mine-Hunting System, Multi-System Torpedo Recognition Alert Processor (MSTRAP), Advanced Radar Periscope Discrimination Detection System (ARPDD), Tactical Decision Support Subsystem (TDSS) and Computer Aided Dead Reckoning Tracer (CADRT). Shortly thereafter he became a software and systems engineer and was selected to head the team that built a Network Operation Center (NOC) that provided services to the command ashore and ships at sea in the Norwegian Sea and Atlantic Ocean.

In 2000, Cardwell formed his own Engineering Solutions company and has been providing consulting services for companies throughout the UK and Europe. He is also an Adjunct Associate Professor for the University of Maryland University College and is the European rep for the Information Assurance curriculum. He holds a BS in Computer Science from National University in California and a MS in Software Engineering from the Southern Methodist University (SMU) in Texas.

Toolkits: All-in-one Approach to Security

Blackhat USA 2005

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Agenda

- Tool Selection Methodology
- Tool Usage
 - Traditional
 - Alternative
- Available Toolkits
- Network Security Toolkit
 - Demo!
- Questions?

Tool Selection

- One of the most difficult things?
 - Finding security tools that
 - You are comfortable configuring
 - Have a reputation of being successful
 - Are FREE!
- Toolkit approach
 - The tool used is not a factor if
 - You are comfortable with the tool
 - The tool performs satisfactorily
 - The tool gets the job done

Tool Usage

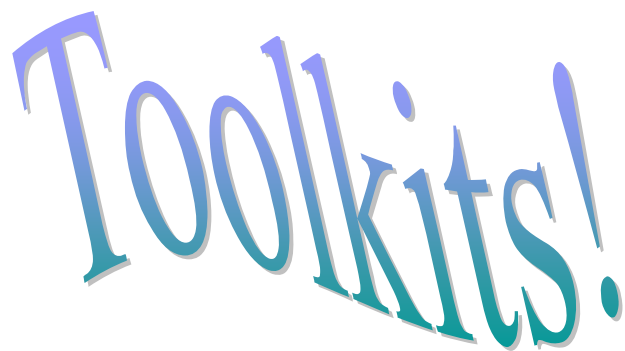
- Two Approaches
 - Traditional
 - Download tool
 - README File
 - ./configure
 - make
 - make INSTALL
 - If all goes well! Run the tool

Traditional Approach Pitfalls

- Did you remember all the dependencies?
 - Libpcap, openssl etc
- Are all the libraries built?
- Is everything the right version?
- Are there specific steps to follow to get the tool running
 - ie: Nessus
- Does the tool work on your OS!

Tool Usage: Cont

- Alternative approach
 - **Tools Available at Boot!**
 - No build requirements
 - No hard drive impact
 - Can use on any machine, and then restore to its normal operation!
 - Use on virtually any Intel system
 - Web based GUI
 - SSL, ssh etc
 - Powerful Scripts!



Toolkits!

Available Toolkits

- Knoppix
 - Father of the majority of the kits
- Helix
 - Forensic based
- PHLAK
 - Designed for “hacking”
- Auditor
 - Plethora of security tools
- Network Security Toolkit
 - Powerful scripts

Knoppix

- Most of the toolkits are based on Knoppix
- Hardware friendly
- Lots of choices:
 - Local Area Security
 - <http://www.localareasecurity.com>
 - Knoppix Security Tools Distribution
 - Kyle Rankin
 - *Knoppix Hacks* – ISBN: 0-595-00787-6

Helix

- Applications dedicated to Incident Response and Forensics.
- Will not auto mount swap space, or auto mount any attached devices
 - Forensically sound
- Special Windows autorun side for Incident Response and Forensics.
- Used by E-fense, SANS and others!
- <http://www.e-fense.com/helix/>

PHLAK

- Professional Hackers Linux Assault Kit
- Derivative of Morpox
 - by Alex de Landgraaf
- <http://www.phlak.org>

Auditor

- Very big
 - 600 MB+
- Tons of tools broken down into areas
 - Scanning
 - Footprinting etc
- Excellent at getting wireless working at boot!
- Tutorials available
 - <http://new.remote-exploit.org/index.php/Tutorials>
- <http://www.remote-exploit.org>

Network Security Toolkit

- My favorite
- The scripts are unbelievable
- From the GUI can run almost everything within clicks of a mouse
- <http://www.networksecuritytoolkit.org>

Introducing the Network Security Toolkit

- Created by:
 - Ronald W. Henderson and Paul Blankenbaker
- Distributed under the GPL (GNU Public License)
 - _ Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed
 - Change is allowed for your own personal use, but not for distribution to others

About the NST

- This bootable ISO CD is based on Fedora Core 2. The toolkit was designed to provide easy access to best-of-breed Open Source Network Security Applications and should run on most x86 platforms.
- When booted in the default manner, access to the running (NST) probe system can be accomplished in the following manner:
 - **Logging in directly to the probe using the console**
 - **logging in via a ssh client program: `ssh root@IP`**
 - **directing a SSL capable web browser to: `https://IP/`**

NST Info

- Boots from an ISO cd image
 - Works on virtually all x86 Intel Architectures
- Creates RAM disk
 - The more RAM the better
- X windows
 - Hit or miss
 - Start by typing *lx vwtm*
 - If problems
 - Run `setup_x` and choose hardware

NST Contents

- The majority of tools published in the article: Top 75 Security Tools by insecure.org are available in the toolkit.
 - Ettercap
 - Man-in-the-middle attacks
 - SSL sniffing
 - Nessus
 - Top 5 scanner
 - Kismet
 - Wireless WEP cracking

NST contents (cont)

- Snort
 - In 2 mouse clicks
 - Full blown with BASE or ACID display
 - **I have never seen an easier Snort setup!!**
- lots more
 - User guide
 - <http://www.networksecuritytoolkit.org/nst/index.html>
 - Man pages

Starting the Toolkit

- Insert CD-Rom
- Boot system
- During the initial boot, at the prompt press space bar for custom boot
 - Several options
 - 2 of note
 - Desktop
 - Laptop (loads all PCMCIA services)

Startup (cont)

- During boot
 - System stops and prompts for a password for root
 - On network interfaces the script looks for a DHCP server
 - If there is no DHCP this fails and the boot continues
- After boot
 - Login as user root with password supplied at boot
- Use ifconfig to setup network
 - ifconfig eth0 10.1.1.? (what ever ip you are assigning)
 - ifconfig eth0 netmask 255.255.255.0

Initial Setup

- Once x starts
 - Right-click on the desktop and select desktop applications
 - Select Firefox
- Firefox will load and prompt for a login
 - Login
 - User root
 - And password supplied at boot

NST WUI (Web User Interface)

- There are 2 options
 - 1. Use the NST from the machine it is running on
 - 2. Connect to it from another machine
 - Open up browser and
 - Type <https://IP ADDRESS/>
 - **NOTE:**
 - » **HTTPS**
 - » **Cannot log in via HTTP due to clear text login**

BLACK HAT BRIEFINGS

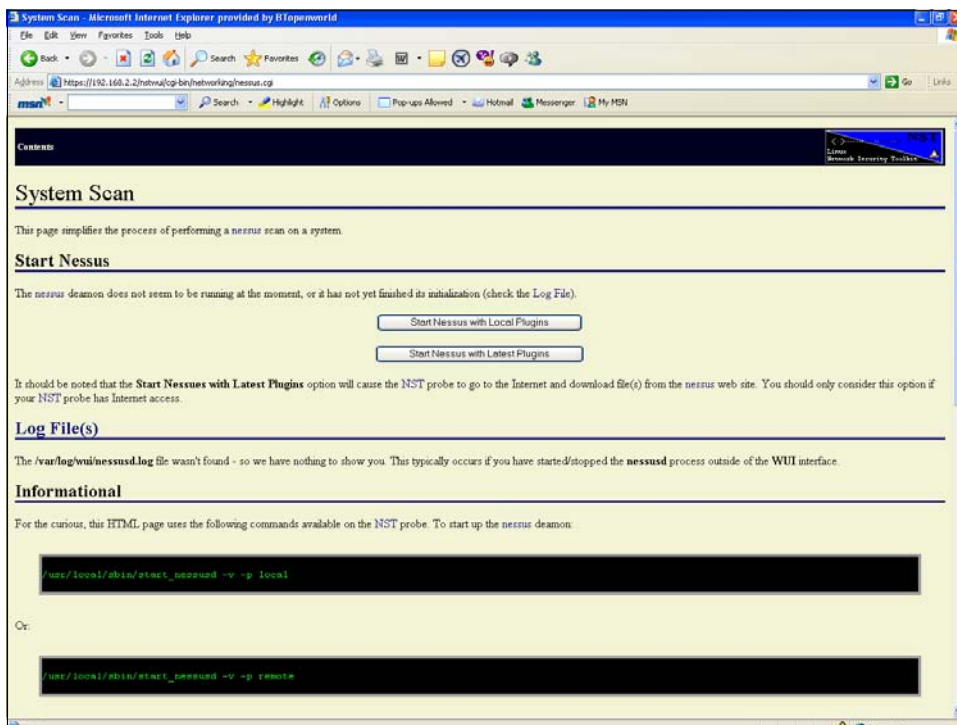
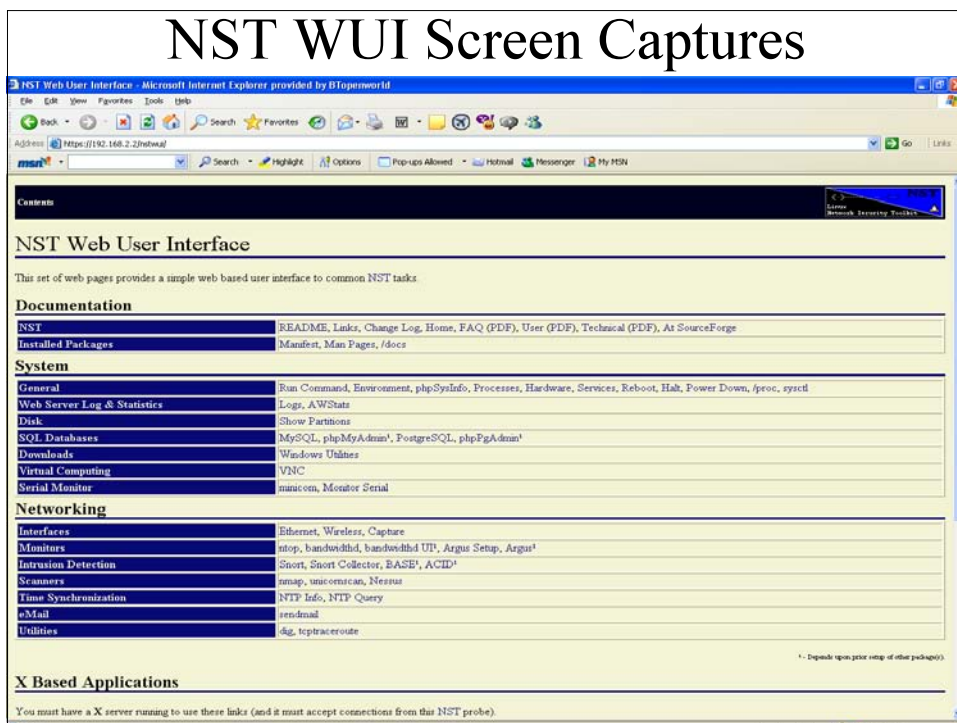
DEMO

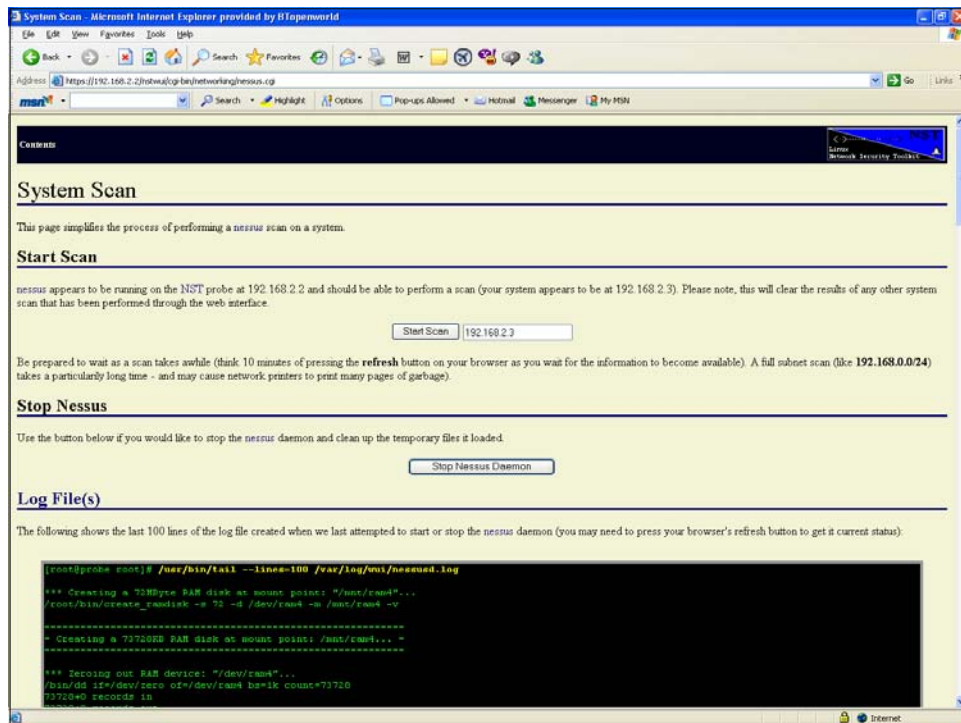
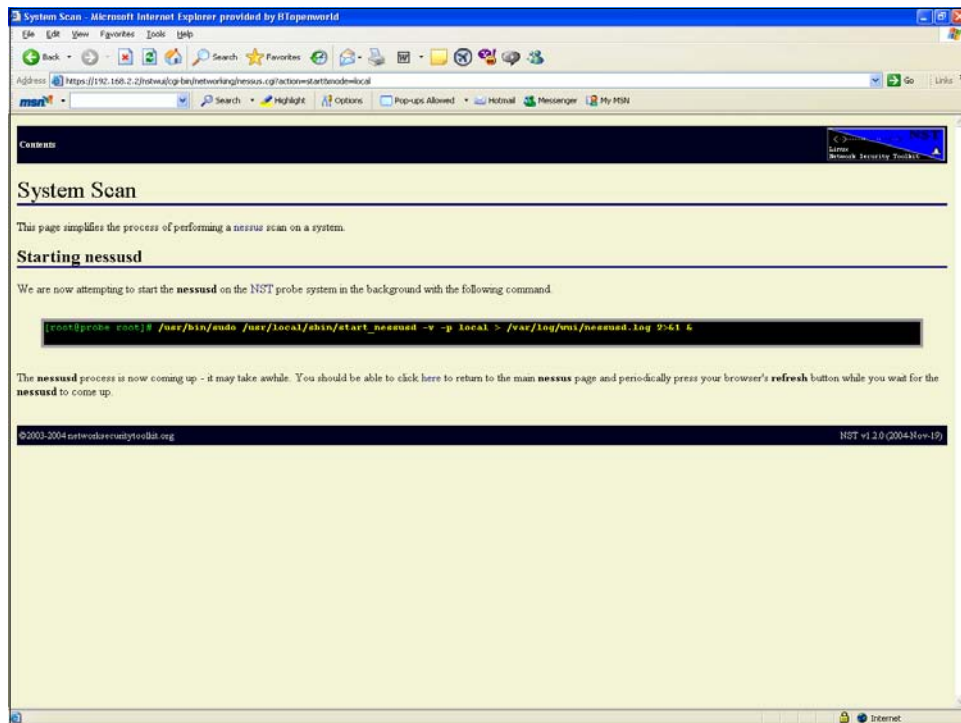
Questions?

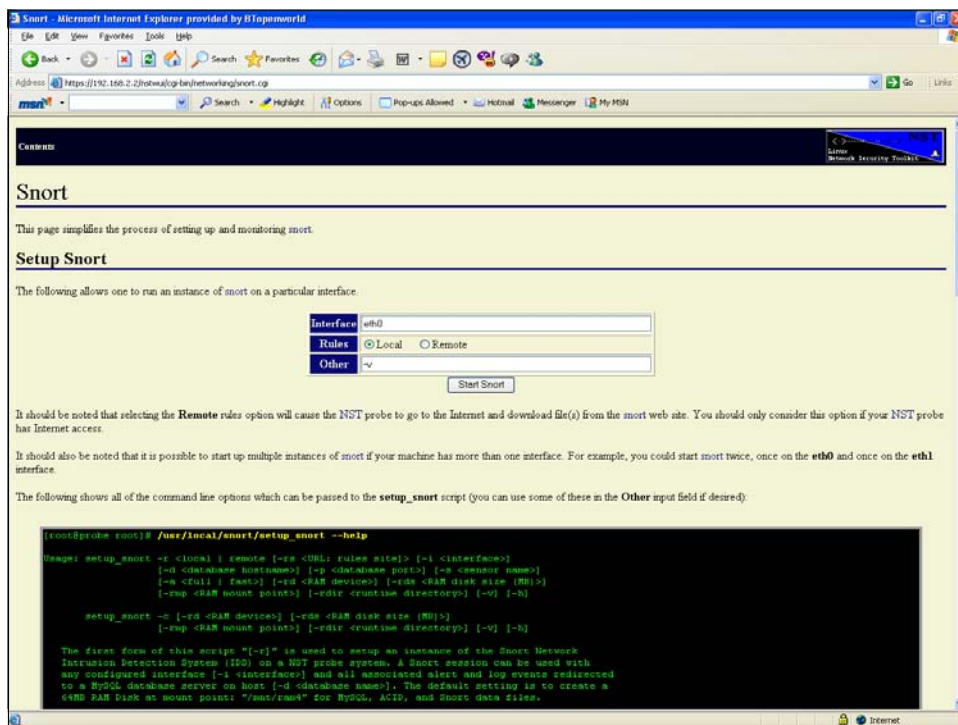
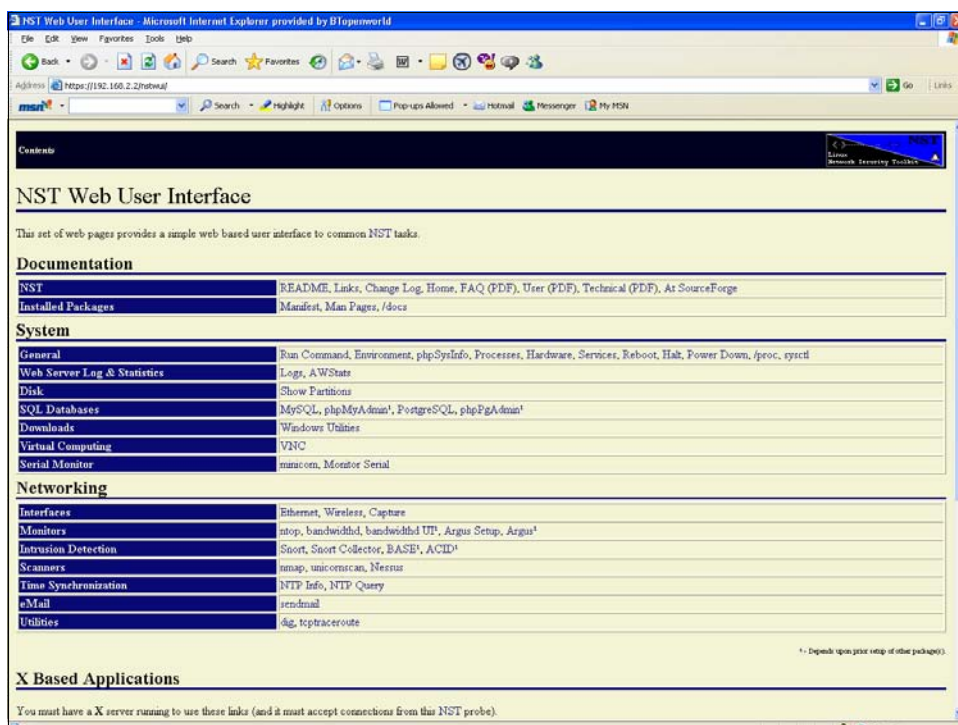


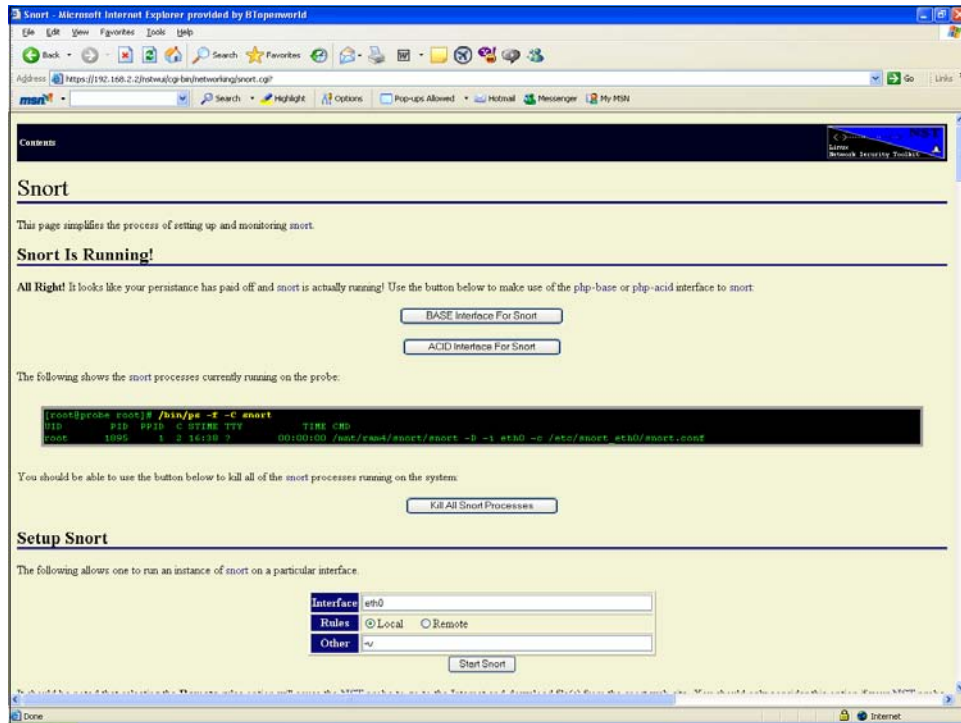
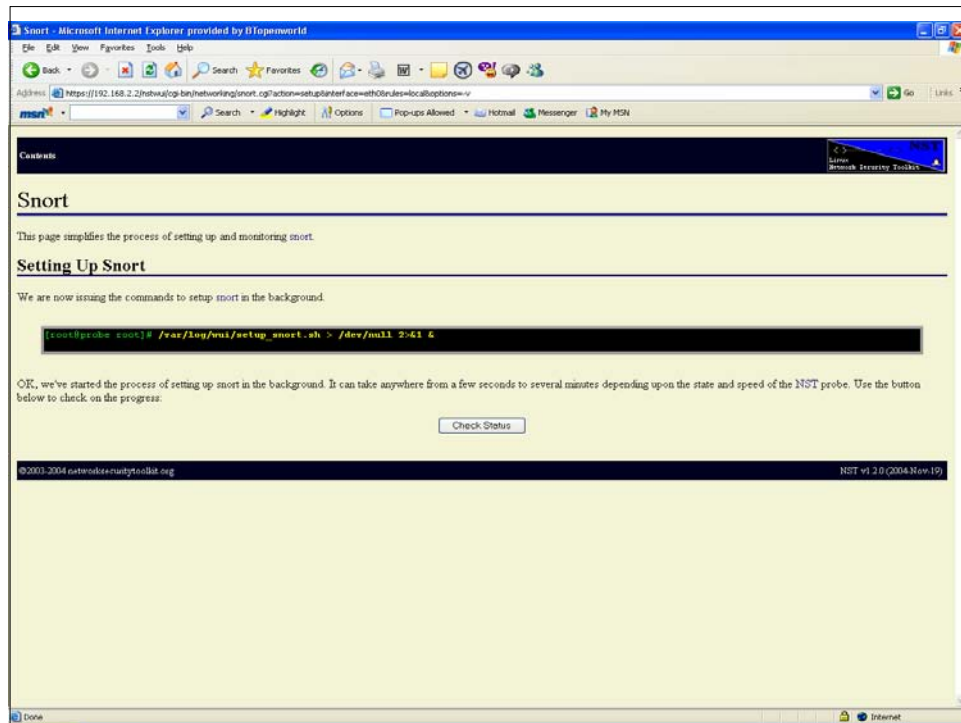
digital self defense

NST WUI Screen Captures









Basic Analysis and Security Engine (BASE) - Microsoft Internet Explorer provided by 010penworld

Address: https://192.168.2.2/base/main.php?

Basic Analysis and Security Engine (BASE)

• Most recent Alerts: any protocol, TCP, UDP, ICMP
 • Today's alerts: unique, listing, IP src / dst
 • Last 24 Hours: alerts unique, listing, IP src / dst
 • Last 72 Hours: alerts unique, listing, IP src / dst
 • Most recent 15 Unique Alerts
 • Last Source Ports: any, TCP, UDP
 • Last Destination Ports: any, TCP, UDP
 • Most frequent 5 Alerts
 • Most Frequent Source Ports: any, TCP, UDP
 • Most Frequent Destination Ports: any, TCP, UDP
 • Most frequent 15 addresses: source, destination

Sensors: 0
 Unique Alerts: 0
 categories: 0
 Total Number of Alerts: 0
 • Src IP address: 0
 • Dest. IP address: 0
 • Unique IP links: 0
 • Source Ports: 0
 • TCP (0) UDP (0)
 • Dest. Ports: 0
 • TCP (0) UDP (0)

Traffic Profile by Protocol
 TCP 0%
 UDP 0%
 ICMP 0%
 Portscan Traffic 0%

Alert Group Maintenance | Cache & Status | Administration
 BASE 0.9.9 (brenna) (by Kevin Johnson and the BASE Project Team
 Built on ACID by Roman Danyliw
 [Loaded in 1 second]

System Scan - Microsoft Internet Explorer provided by 010penworld

Address: https://192.168.2.2/networking/nessus.cgi

System Scan

This page simplifies the process of performing a nessus scan on a system.

Start Scan

nessus appears to be running on the NST probe at 192.168.2.2 and should be able to perform a scan (your system appears to be at 192.168.2.3). Please note, this will clear the results of any other system scan that has been performed through the web interface.

Start Scan 192.168.2.3

Be prepared to wait as a scan takes awhile (think 10 minutes of pressing the refresh button on your browser as you wait for the information to become available). A full subnet scan (like 192.168.0.0/24) takes a particularly long time - and may cause network printers to print many pages of garbage).

Stop Nessus

Use the button below if you would like to stop the nessus daemon and clean up the temporary files it loaded.

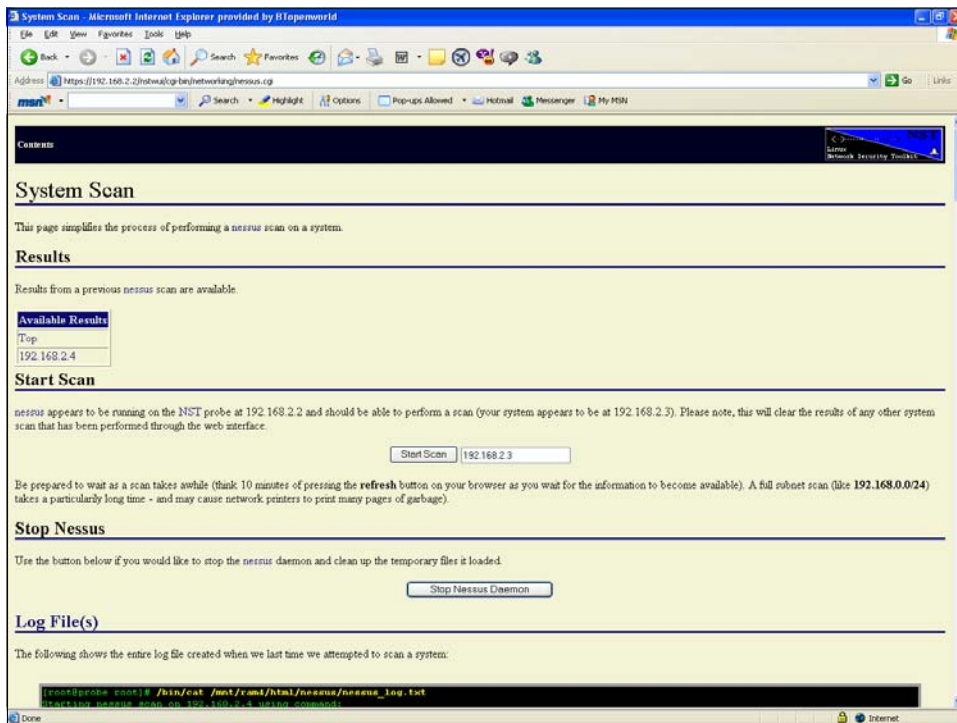
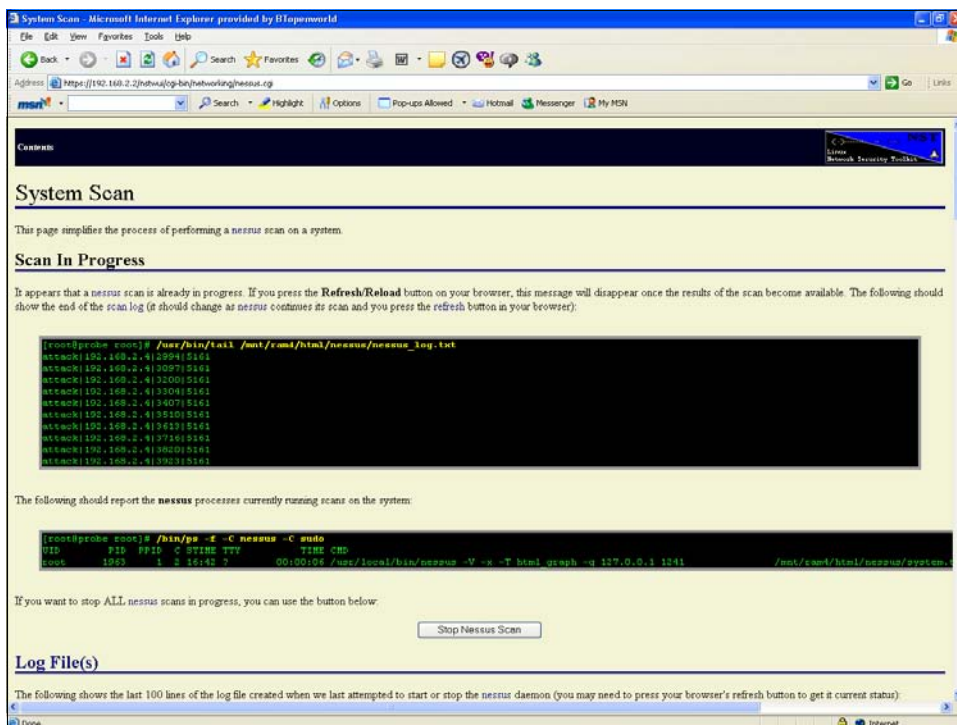
Stop Nessus Daemon

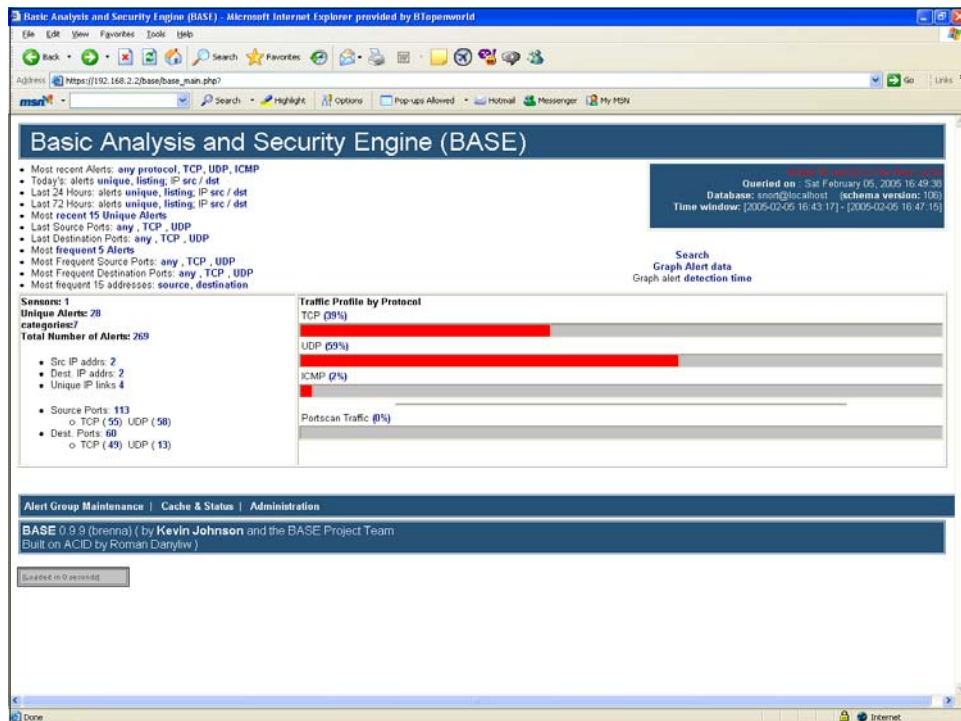
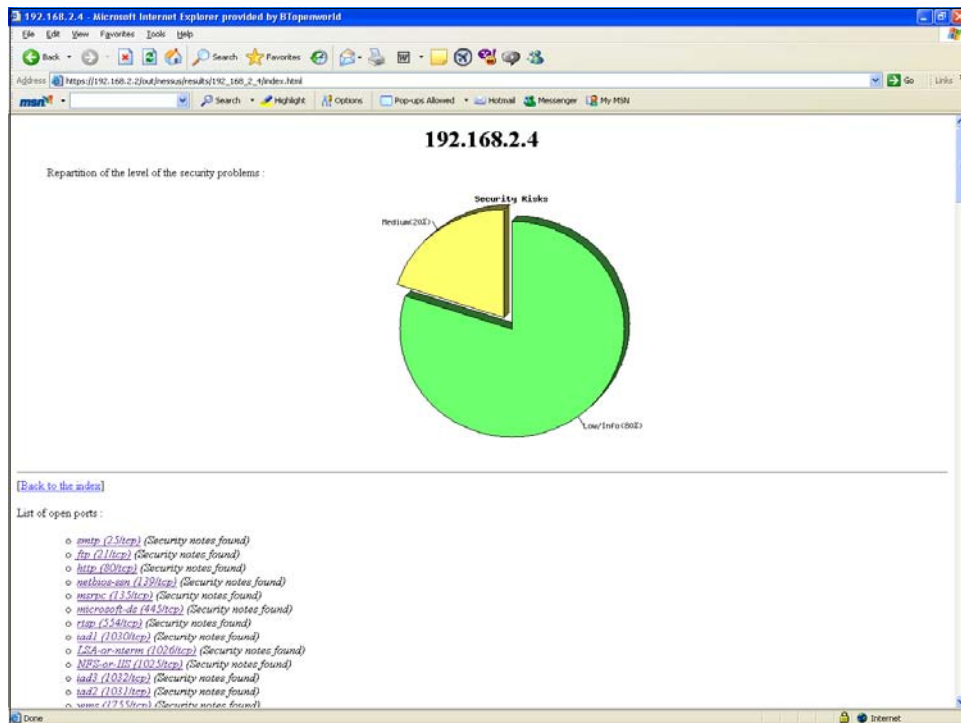
Log File(s)

The following shows the last 100 lines of the log file created when we last attempted to start or stop the nessus daemon (you may need to press your browser's refresh button to get it current status):

```
[root@probe root]# /usr/bin/tail -n100 /var/log/nst/nessusd.log
*** Creating a 7372000 RAM disk at mount point: /mnt/cram4...
/usr/bin/create_ramdisk -s 73 -s /dev/cram -m /mnt/cram -v
*** Creating a 7372000 RAM disk at mount point: /mnt/cram4...
*** Decoding out RAM device: "/dev/cram4"...
/usr/bin/ifs/dev/cram4 of="/dev/cram4" bar1k count=73720
73720=0 records in
```







Basic Analysis and Security (BIAS): Query Results - Microsoft Internet Explorer provided by Btapemort

File Edit View Favorites Tools Help

Address: https://192.168.2.2/base/base_gry_main.php?news=1&layer=1&CPInews_result_rows=1&sort_order=news_desc&news=Query+Q6

Search Highlight Options Pop-ups Allowed Hotmail Messenger My MSN

Added 0 alert(s) to the Alert cache

Overlaid DB on: Sat February 05, 2005 16:51:45

Meta Criteria any
IP Criteria any
TCP Criteria any
Payload Criteria any

Summary Statistics

- Sensors
- Unique Alerts (classifications)
 - Unique addresses: source / destination
- Unique IP links
- Source Port: TCP / UDP
- Destination Port: TCP / UDP
- Time profile of alerts

Displaying alerts 1-50 of 104 total

ID	Signature	Timestamp	Source Address	Dest. Address	Layer 4 Proto
#0 (1-205)	[eve][cat][bugtraq][arachNIDS][snort] MISC source route issue	2005-02-05 16:47:14	192.168.2.445	192.168.2.25564	TCP
#1 (1-206)	[eve][cat][bugtraq][arachNIDS][snort] MISC source route issue	2005-02-05 16:47:14	192.168.2.445	192.168.2.25564	TCP
#2 (1-263)	[eve][cat][bugtraq][arachNIDS][snort] MISC source route issue	2005-02-05 16:47:08	192.168.2.445	192.168.2.25564	TCP
#3 (1-264)	[eve][cat][bugtraq][arachNIDS][snort] MISC source route issue	2005-02-05 16:47:08	192.168.2.445	192.168.2.25564	TCP
#4 (1-259)	[eve][cat][bugtraq][arachNIDS][snort] MISC source route issue	2005-02-05 16:47:05	192.168.2.25564	192.168.2.445	TCP
#5 (1-260)	[eve][cat][bugtraq][arachNIDS][snort] MISC source route issue	2005-02-05 16:47:05	192.168.2.25564	192.168.2.445	TCP
#6 (1-261)	[eve][cat][bugtraq][arachNIDS][snort] MISC source route issue	2005-02-05 16:47:05	192.168.2.445	192.168.2.25564	TCP
#7 (1-262)	[eve][cat][bugtraq][arachNIDS][snort] MISC source route issue	2005-02-05 16:47:05	192.168.2.445	192.168.2.25564	TCP
#8 (1-255)	[arachNIDS][snort] SCAN SYN FIN	2005-02-05 16:46:49	192.168.2.2.10004	192.168.2.4.1025	TCP
#9 (1-254)	[arachNIDS][snort] SCAN SYN FIN	2005-02-05 16:46:48	192.168.2.2.10004	192.168.2.4.1025	TCP
#10 (1-249)	[snort] BAD-TRAFFIC: tcp port 0 traffic	2005-02-05 16:46:39	192.168.2.4.0	192.168.2.2.2965	TCP
#11 (1-250)	[snort] BAD-TRAFFIC: tcp port 0 traffic	2005-02-05 16:46:39	192.168.2.2.6477	192.168.2.4.0	TCP
#12 (1-251)	[snort] BAD-TRAFFIC: tcp port 0 traffic	2005-02-05 16:46:39	192.168.2.4.0	192.168.2.2.6477	TCP
#13 (1-252)	[snort] BAD-TRAFFIC: tcp port 0 traffic	2005-02-05 16:46:39	192.168.2.2.50297	192.168.2.4.0	TCP
#14 (1-248)	[snort] BAD-TRAFFIC: tcp port 0 traffic	2005-02-05 16:46:38	192.168.2.4.0	192.168.2.2.34710	TCP
#15 (1-241)	[snort] BAD-TRAFFIC: tcp port 0 traffic	2005-02-05 16:46:38	192.168.2.4.0	192.168.2.2.6369	TCP
#16 (1-242)	[snort] BAD-TRAFFIC: tcp port 0 traffic	2005-02-05 16:46:38	192.168.2.2.19541	192.168.2.4.0	TCP
#17 (1-243)	[snort] BAD-TRAFFIC: tcp port 0 traffic	2005-02-05 16:46:38	192.168.2.4.0	192.168.2.2.19541	TCP
#18 (1-244)	[snort] BAD-TRAFFIC: tcp port 0 traffic	2005-02-05 16:46:38	192.168.2.2.62590	192.168.2.4.0	TCP
#19 (1-245)	[snort] BAD-TRAFFIC: tcp port 0 traffic	2005-02-05 16:46:38	192.168.2.4.0	192.168.2.2.62598	TCP
#20 (1-246)	[snort] BAD-TRAFFIC: tcp port 0 traffic	2005-02-05 16:46:38	192.168.2.2.30025	192.168.2.4.0	TCP
#21 (1-247)	[snort] BAD-TRAFFIC: tcp port 0 traffic	2005-02-05 16:46:38	192.168.2.4.0	192.168.2.2.30025	TCP
#22 (1-248)	[snort] BAD-TRAFFIC: tcp port 0 traffic	2005-02-05 16:46:38	192.168.2.2.2965	192.168.2.4.0	TCP
#23 (1-239)	[snort] BAD-TRAFFIC: tcp port 0 traffic	2005-02-05 16:46:37	192.168.2.2.6368	192.168.2.4.0	TCP
#24 (1-237)	[snort] BAD-TRAFFIC: tcp port 0 traffic	2005-02-05 16:46:36	192.168.2.4.0	192.168.2.2.23324	TCP
#25 (1-238)	[snort] BAD-TRAFFIC: tcp port 0 traffic	2005-02-05 16:46:36	192.168.2.2.34710	192.168.2.4.0	TCP
#26 (1-235)	[snort] BAD-TRAFFIC: tcp port 0 traffic	2005-02-05 16:46:36	192.168.2.4.0	192.168.2.2.62514	TCP

Basic Analysis and Security Engine (BASE)

Home | Search | AG Maintenance

Added 0 alert(s) to the Alert cache

Queried DB on: Sat February 05, 2006 16:53:52

Meta Criteria	any
IP Criteria	any
UDP Criteria	any
Payload Criteria	any

Summary Statistics

- Unique Alerts (classifications)
- Unique addresses: source / destination
- Unique IP links
- Source Port: TCP / UDP
- Destination Port: TCP / UDP
- Time profile of alerts

Displaying alerts 1-50 of 150 total

ID	Signature	< Timestamp >	< Source Address >	< Dest. Address >	< Layer 4 Proto >
#0 (1-267)	[snort] TFTP GET passed	2005-02-05 16:47:15	192.168.2.2 32905	192.168.2.4 69	UDP
#1 (1-268)	[snort] TFTP Get	2005-02-05 16:47:15	192.168.2.2 32905	192.168.2.4 69	UDP
#2 (1-269)	[cve][cat][cve][cat][arachNIDS][snort] TFTP parent directory	2005-02-05 16:47:15	192.168.2.2 32905	192.168.2.4 69	UDP
#3 (1-256)	[snort] TFTP GET passed	2005-02-05 16:46:54	192.168.2.2 32905	192.168.2.4 69	UDP
#4 (1-257)	[cve][cat][arachNIDS][snort] TFTP root directory	2005-02-05 16:46:54	192.168.2.2 32905	192.168.2.4 69	UDP
#5 (1-258)	[snort] TFTP Get	2005-02-05 16:46:54	192.168.2.2 32905	192.168.2.4 69	UDP
#6 (1-253)	[snort] TFTP Get	2005-02-05 16:46:40	192.168.2.2 4315	192.168.2.4 69	UDP
#7 (1-229)	[cve][cat][cve][cat][cve][cat][bugtraq][bugtraq][bugtraq][snort] SNMP public access udp	2005-02-05 16:46:35	192.168.2.2 32905	192.168.2.4 161	UDP
#8 (1-230)	[cve][cat][cve][cat][bugtraq][bugtraq][bugtraq][snort] SNMP request udp	2005-02-05 16:46:35	192.168.2.2 32905	192.168.2.4 161	UDP
#9 (1-197)	[cve][cat][snort] DDOS mstream handler ping to agent	2005-02-05 16:46:23	192.168.2.2 65535	192.168.2.4 10498	UDP
#10 (1-469)	[arachNIDS][snort] DDOS ssh handler to agent	2005-02-05 16:46:16	192.168.2.2 1024	192.168.2.4 18753	UDP
#11 (1-156)	nessus[snort] MS-SQL ping attempt	2005-02-05 16:46:12	192.168.2.2 32899	192.168.2.4 1434	UDP
#12 (1-155)	[snort] (apt-kix) Black Office Traffic detected	2005-02-05 16:46:11	192.168.2.2 32899	192.168.2.4 91837	UDP
#13 (1-154)	nessus[snort] MISC AFS access	2005-02-05 16:46:08	192.168.2.2 32898	192.168.2.4 7001	UDP
#14 (1-153)	nessus[snort] MISC AFS access	2005-02-05 16:46:07	192.168.2.2 32898	192.168.2.4 7001	UDP
#15 (1-149)	nessus[snort] MISC AFS access	2005-02-05 16:46:06	192.168.2.2 32898	192.168.2.4 7001	UDP
#16 (1-150)	[arachNIDS][snort] DDOS Tim0 Master to Daemon default password attempt	2005-02-05 16:46:06	192.168.2.2 1024	192.168.2.4 27444	UDP
#17 (1-151)	[snort] SCAN Amanda client version request	2005-02-05 16:46:06	192.168.2.2 32896	192.168.2.4 10080	UDP
#18 (1-152)	[snort] SCAN Amanda client version request	2005-02-05 16:46:06	192.168.2.2 32899	192.168.2.4 10081	UDP
#19 (1-148)	[snort] SCAN Amanda client version request	2005-02-05 16:46:05	192.168.2.2 32896	192.168.2.4 10080	UDP
#20 (1-130)	[cve][cat][bugtraq][snort] SNMP missing community string attempt	2005-02-05 16:46:54	192.168.2.2 32871	192.168.2.4 161	UDP
#21 (1-131)	[cve][cat][cve][cat][bugtraq][bugtraq][bugtraq][snort] SNMP request udp	2005-02-05 16:46:54	192.168.2.2 32871	192.168.2.4 161	UDP

BLACK HAT BRIEFINGS

Snort.org - Microsoft Internet Explorer provided by BitTopomworld

Address: <http://www.snort.org/snort-db/rule.html?rule=1443>

Snort Signature Database

By SID: search

By Message: search

GEN:SID: 1443

Message: TFTP GET passwd

Rule: alert udp any any -> any 69 (msg "TFTP GET passwd", content "00 01", depth 2, content "passwd", offset 2, nocase, classtype successful-admin, sid 1443, rev 4)

Summary: This event is generated when a TFTP GET request is made for the "passwd" file. This could be an indication that a remote attacker has compromised a system on the network and is transferring sensitive files back to the attacking system. It may also be an indication of a generic TFTP server scan that includes tests for generic system files.

Impact: The "passwd" file normally stores users names for Unix based systems. If this file is being transferred over the network using TFTP it is normally an indication of a system compromise.

Detailed Information: In some situations this rule may only indicate a generic TFTP scan attempt, as the attacker may be scanning a large range of IP addresses for TFTP improperly configured TFTP servers.

Affected Systems: This rule searches for the filename "passwd" in TFTP GET requests. The "passwd" file is used by Unix based systems to store users names for the system.

Attack Scenarios: After a successful system compromise an attacker may setup a tftp service to transfer files back to the attacking system. Under this scenario the source address will point to the attack network and the destination address will be an address defined in the HOME_NET.

Ease of Attack: Attackers may also scan large subnets for TFTP servers and make numerous generic GET requests for common system files.

False Positives: Single. Numerous tools and automated scripts exist for scanning large subnets for improperly configured TFTP servers.

False Negatives: This rule was created to catch TFTP GET requests for "passwd", if this file is being used during a legitimate TFTP session this rule will generate a false positive.

Corrective Action: If you think this rule has a false positive, please [help](#) fill it out.

None known.

If you think this rule has a false negative, please [help](#) fill it out.

Depending on the situation blocking the attacker at the upstream router or firewall will eliminate the problem. However, if the TFTP server is

Basic Analysis and Security Engine (BASE): Alert - Microsoft Internet Explorer provided by BitTopomworld

Address: https://192.168.2.2/base/base_ry_alert.php?subnet=192.168.2.2&alert_order=time_d

UDP Criteria: any

Payload Criteria: any

Added 0 alert(s) to the Alert cache

Alert #1

[First] >> Next #1-(1-260)

ID #	Time	Triggered Signature
1 - 267	2005-02-05 16:47:15	[snort] TFTP GET passwd

Meta

name	interface	filter
192.168.2.2	eth0	none

Alert Group: none

IP

source addr	dest addr	Ver	Dir	Len	TOS	length	ID	flags	offset	TTL	chksum
192.168.2.2	192.168.2.1	4	S	0	50	5440	0	0	64	40967	

Options: none

UDP

source port	dest port	length
32905	69	30

length = 22

Payload

000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047	048	049	050	051	052	053	054	055	056	057	058	059	060	061	062	063	064	065	066	067	068	069	070	071	072	073	074	075	076	077	078	079	080	081	082	083	084	085	086	087	088	089	090	091	092	093	094	095	096	097	098	099	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255
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octet:/etc/passwd.

octet:

[First] >> Next #1-(1-260)

Action

[action] Selected

Quoted in 0 second

digital self defense

digital self defense

