

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**

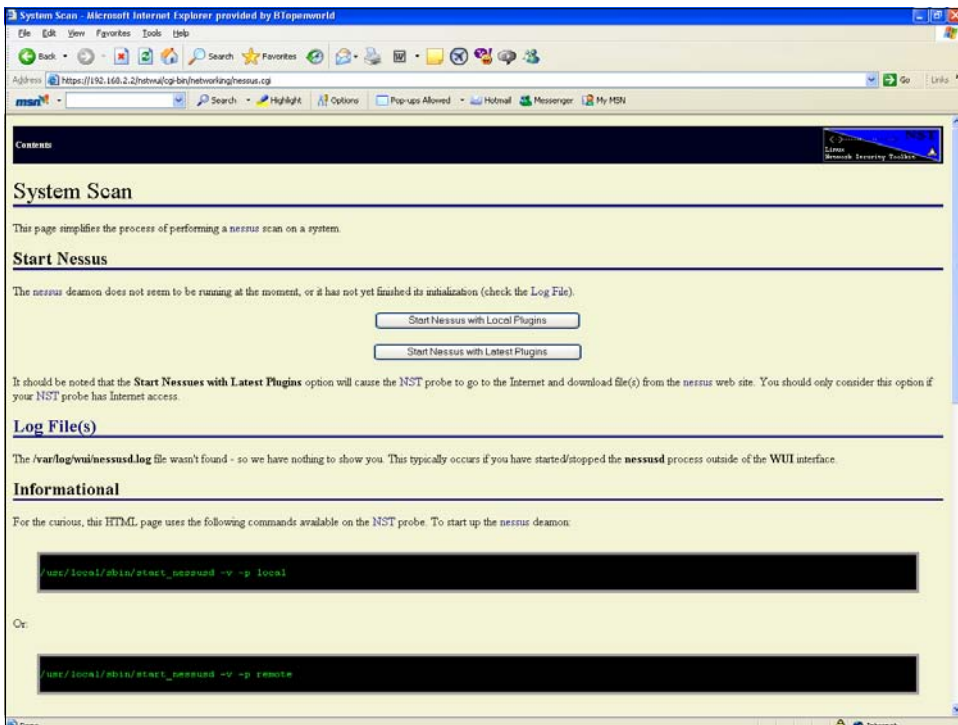
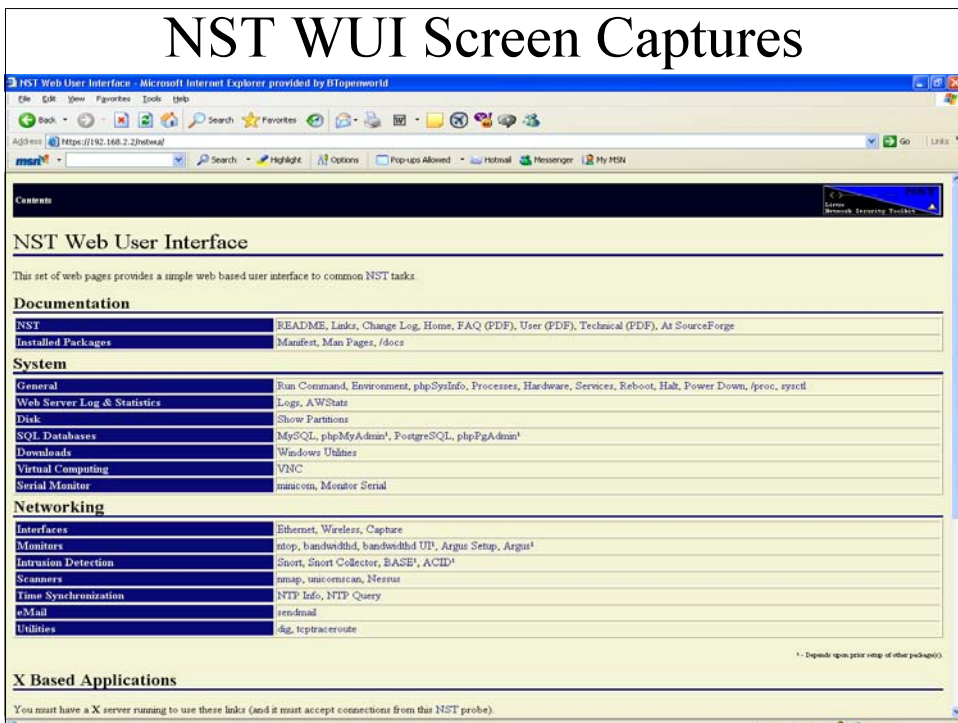
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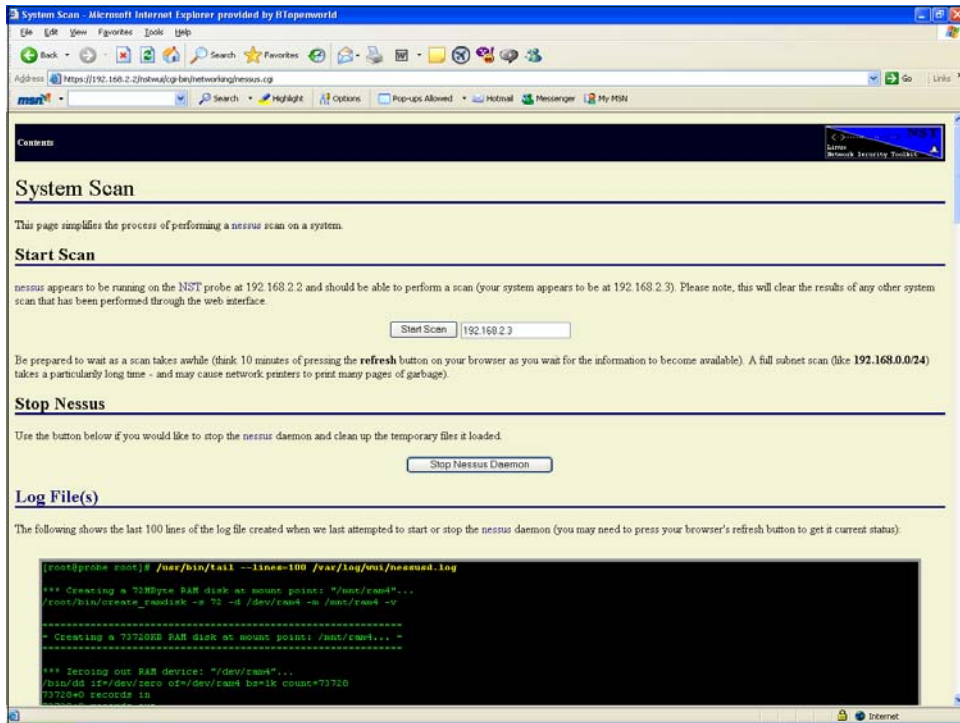
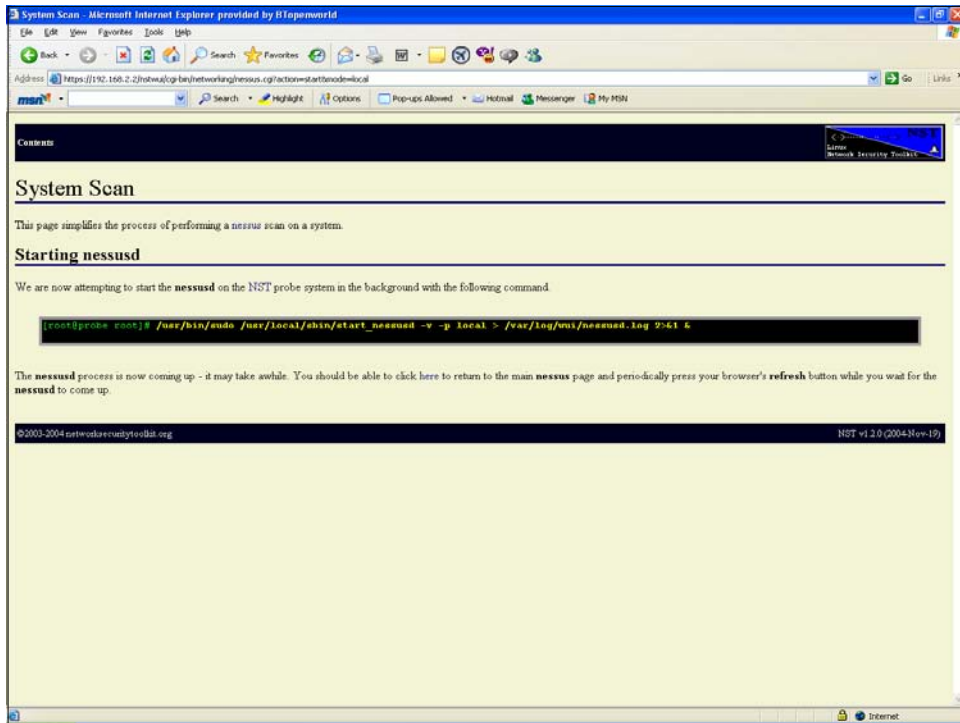
DEMO

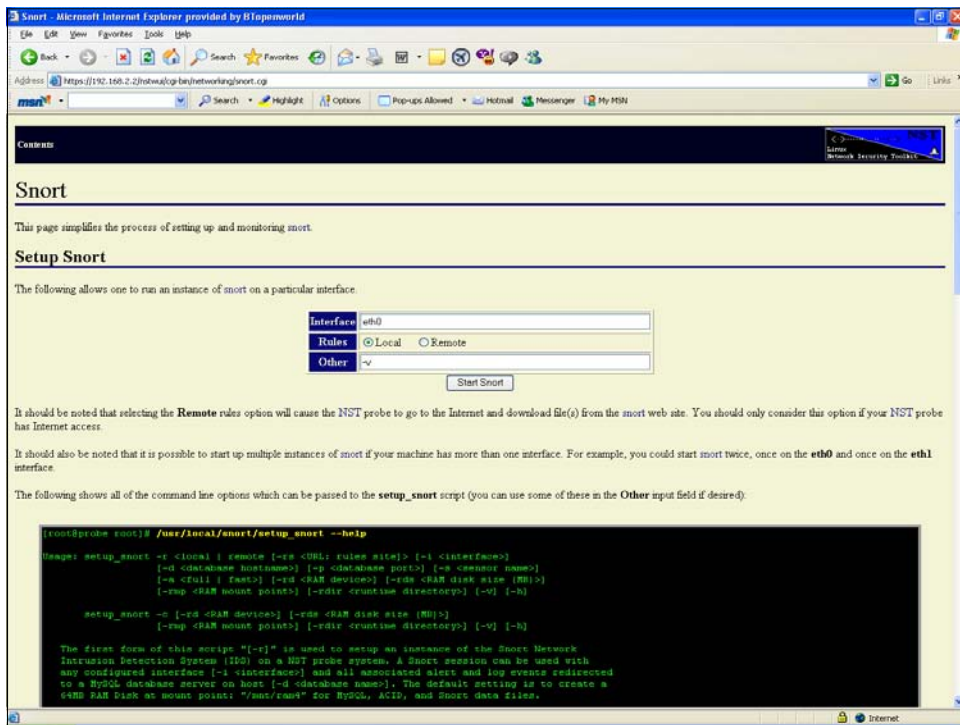
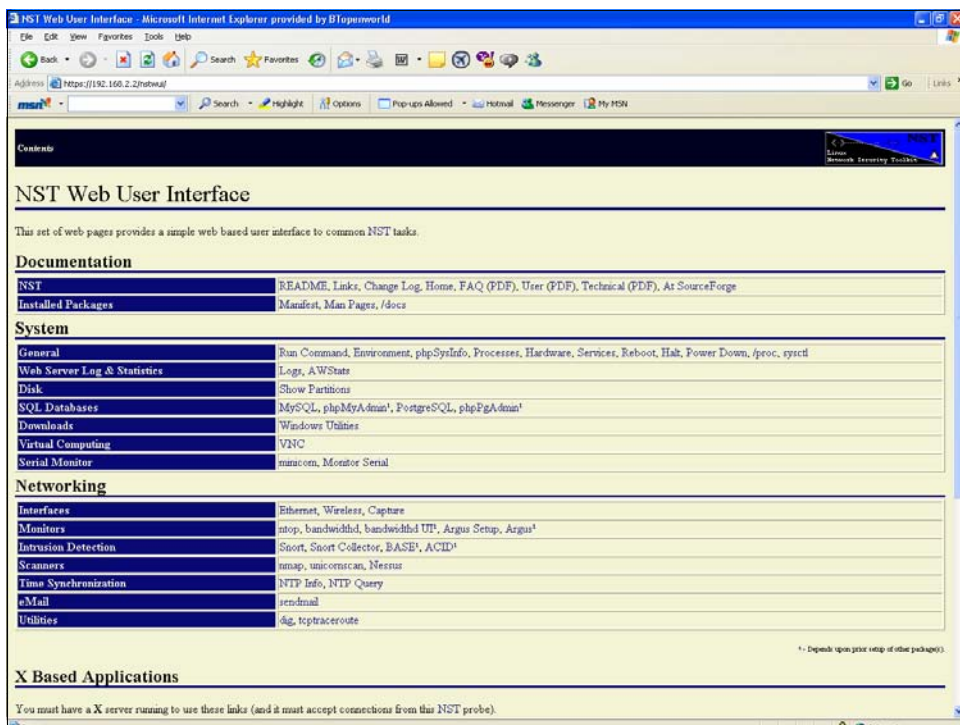
Questions?

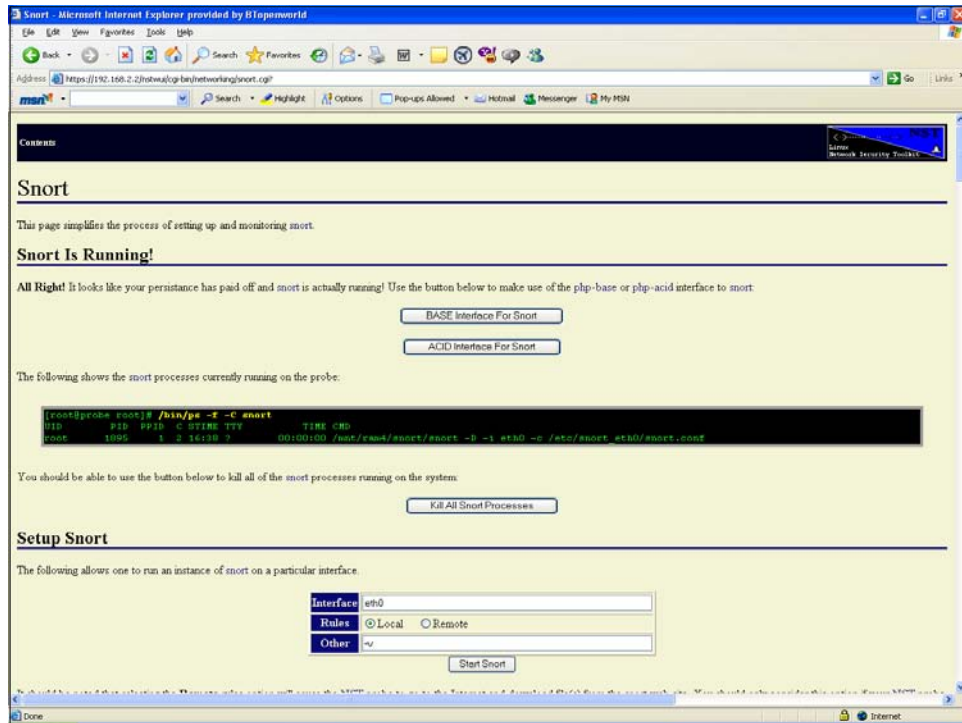
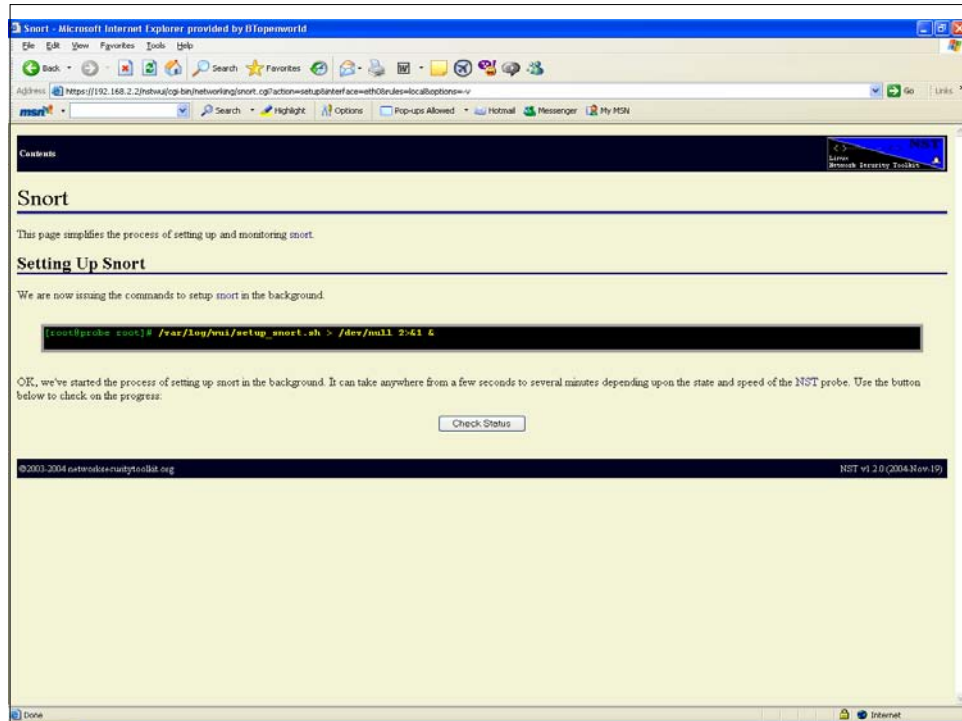


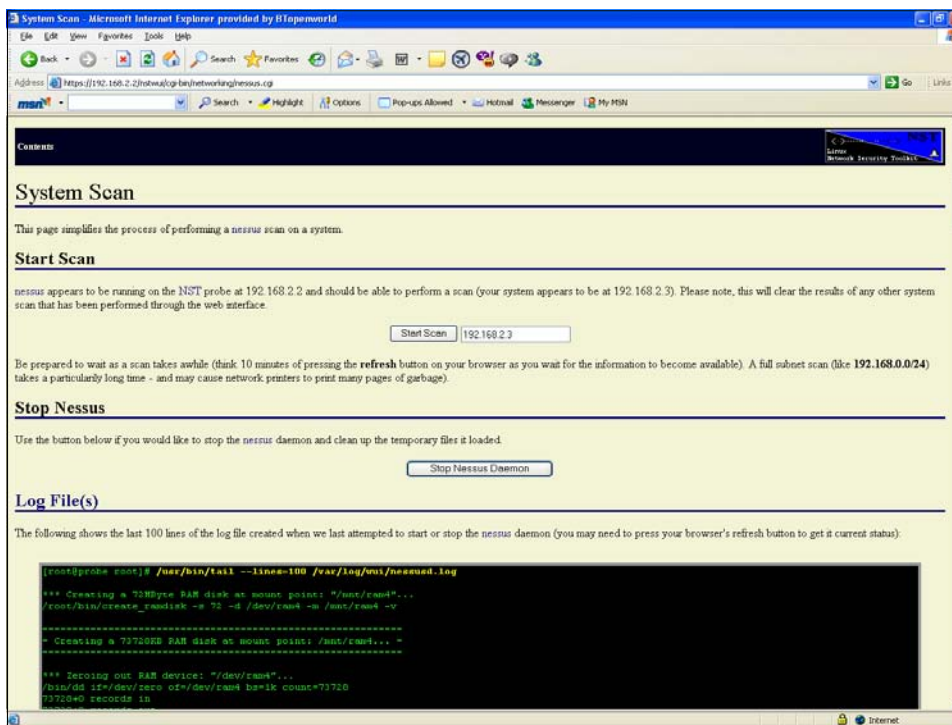
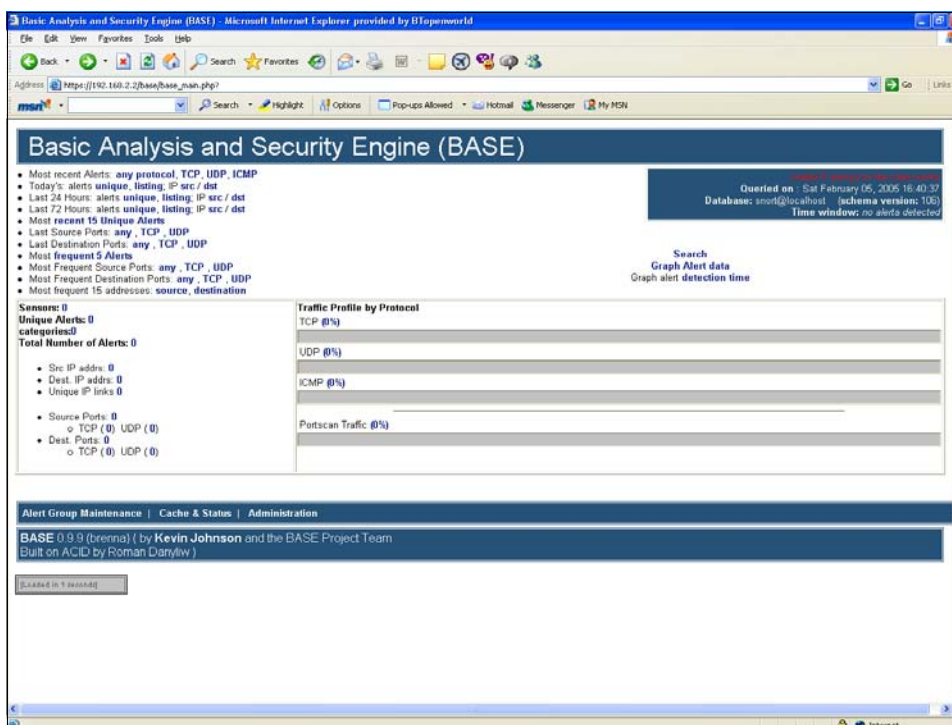
NST WUI Screen Captures

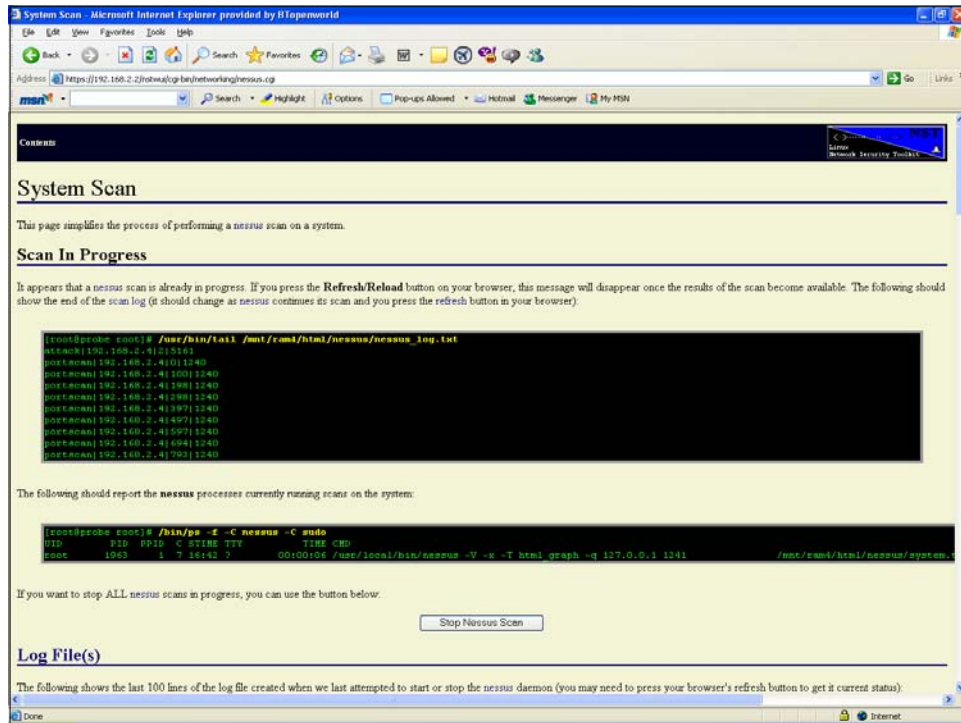
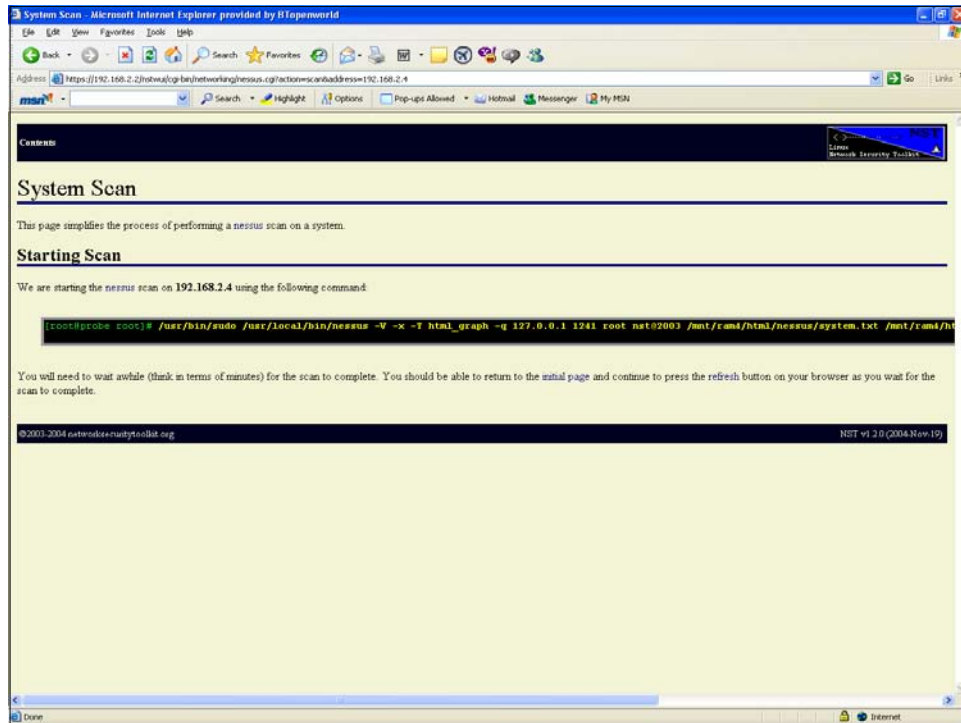


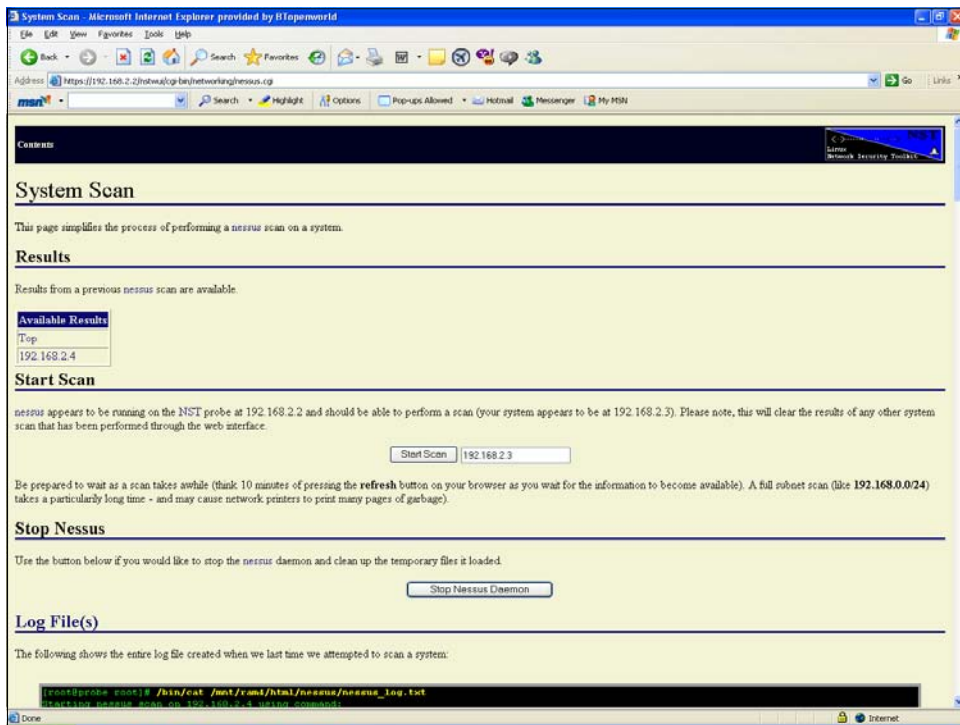
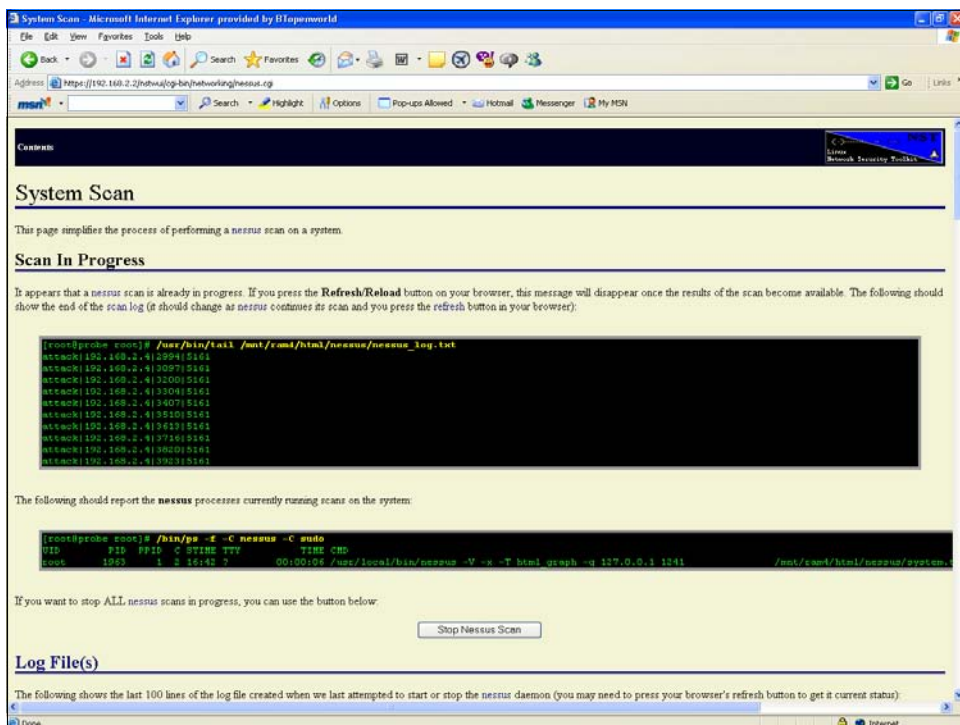




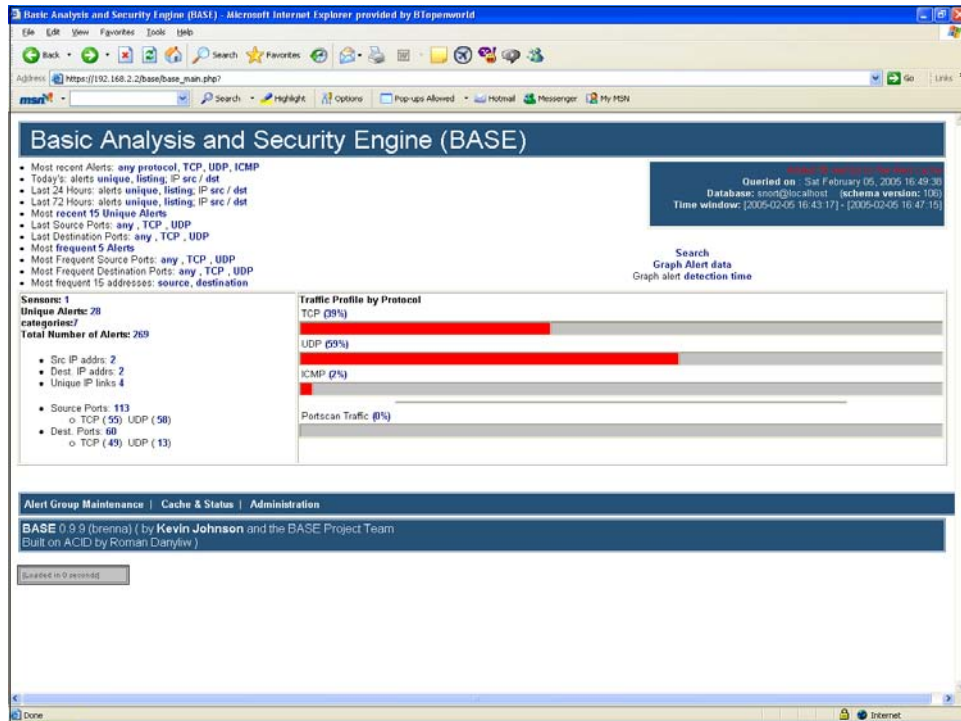
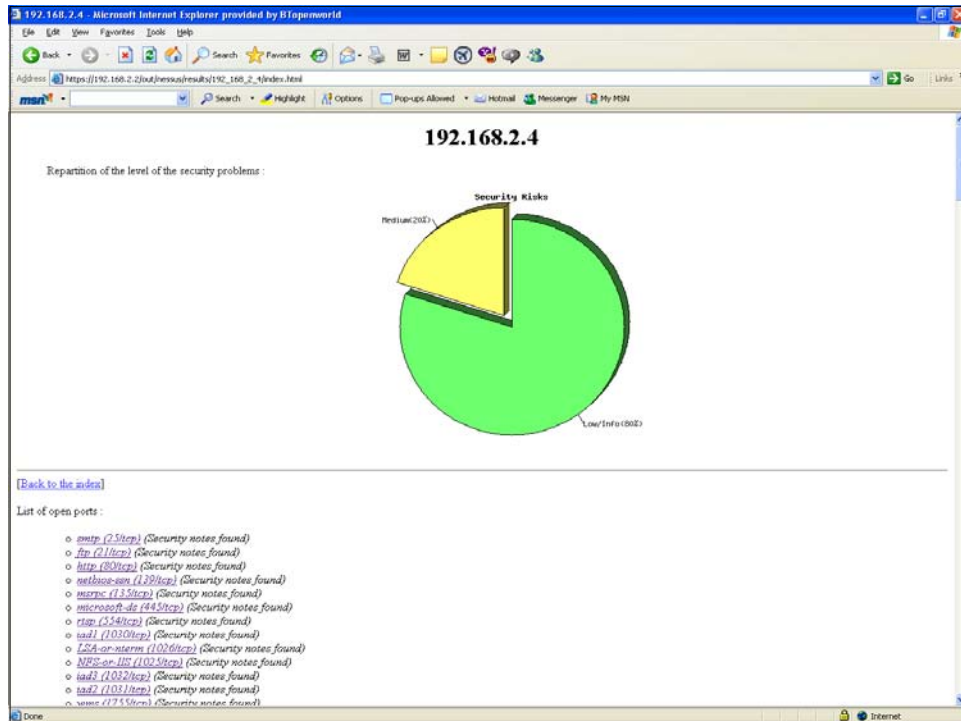








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Added 0 alert(s) to the Alert cache

Queried 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 blocks
- 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 (1265)	[eve][icat][bugtraq][arachNIDS][snort] MISC source route lsrr	2005-02-05 16:47:14	192.168.2.4.445	192.168.2.2.25564	TCP
#1 (1266)	[eve][icat][bugtraq][arachNIDS][snort] MISC source route lsrr	2005-02-05 16:47:14	192.168.2.4.445	192.168.2.2.25564	TCP
#2 (1263)	[eve][icat][bugtraq][arachNIDS][snort] MISC source route lsrr	2005-02-05 16:47:08	192.168.2.4.445	192.168.2.2.25564	TCP
#3 (1264)	[eve][icat][bugtraq][arachNIDS][snort] MISC source route lsrr	2005-02-05 16:47:08	192.168.2.4.445	192.168.2.2.25564	TCP
#4 (1259)	[eve][icat][bugtraq][arachNIDS][snort] MISC source route lsrr	2005-02-05 16:47:05	192.168.2.2.25564	192.168.2.4.445	TCP
#5 (1260)	[eve][icat][bugtraq][arachNIDS][snort] MISC source route lsrr	2005-02-05 16:47:05	192.168.2.2.25564	192.168.2.4.445	TCP
#6 (1261)	[eve][icat][bugtraq][arachNIDS][snort] MISC source route lsrr	2005-02-05 16:47:05	192.168.2.4.445	192.168.2.2.25564	TCP
#7 (1262)	[eve][icat][bugtraq][arachNIDS][snort] MISC source route lsrr	2005-02-05 16:47:05	192.168.2.4.445	192.168.2.2.25564	TCP
#8 (1255)	[arachNIDS][snort] SCAN SYN FIN	2005-02-05 16:46:49	192.168.2.2.10004	192.168.2.4.1025	TCP
#9 (1254)	[arachNIDS][snort] SCAN SYN FIN	2005-02-05 16:46:48	192.168.2.2.10004	192.168.2.4.1025	TCP
#10 (1249)	[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 (1250)	[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 (1251)	[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 (1252)	[snort] BAD-TRAFFIC tcp port 0 traffic	2005-02-05 16:46:39	192.168.2.2.50207	192.168.2.4.0	TCP
#14 (1248)	[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 (1241)	[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 (1242)	[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 (1243)	[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 (1244)	[snort] BAD-TRAFFIC tcp port 0 traffic	2005-02-05 16:46:38	192.168.2.2.62588	192.168.2.4.0	TCP
#19 (1245)	[snort] BAD-TRAFFIC tcp port 0 traffic	2005-02-05 16:46:38	192.168.2.4.0	192.168.2.2.62588	TCP
#20 (1246)	[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 (1247)	[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 (1248)	[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 (1239)	[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 (1237)	[snort] BAD-TRAFFIC tcp port 0 traffic	2005-02-05 16:46:36	192.168.2.2.34710	192.168.2.4.0	TCP
#25 (1238)	[snort] BAD-TRAFFIC tcp port 0 traffic	2005-02-05 16:46:36	192.168.2.4.0	192.168.2.2.34710	TCP

Added 0 alert(s) to the Alert cache

Queried DB on : Sat February 05, 2005 16:52:52

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

Summary Statistics

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

Displaying alerts 1-50 of 160 total

ID	Signature	Timestamp	Source Address	Dest. Address	Layer 4 Proto
#0 (1267)	[snort] TFTF GET passed	2005-02-05 16:47:15	192.168.2.2.32005	192.168.2.4.69	UDP
#1 (1268)	[snort] TFTF Gat	2005-02-05 16:47:15	192.168.2.2.32005	192.168.2.4.69	UDP
#2 (1269)	[eve][icat][eve][icat][arachNIDS][snort] TFTF parent directory	2005-02-05 16:47:15	192.168.2.2.32005	192.168.2.4.69	UDP
#3 (1256)	[snort] TFTF GET passed	2005-02-05 16:46:54	192.168.2.2.32005	192.168.2.4.69	UDP
#4 (1257)	[eve][icat][arachNIDS][snort] TFTF root directory	2005-02-05 16:46:54	192.168.2.2.32005	192.168.2.4.69	UDP
#5 (1258)	[snort] TFTF Gat	2005-02-05 16:46:54	192.168.2.2.32005	192.168.2.4.69	UDP
#6 (1253)	[snort] TFTF Gat	2005-02-05 16:46:40	192.168.2.2.4315	192.168.2.4.69	UDP
#7 (1229)	[eve][icat][eve][icat][eve][icat][bugtraq][bugtraq][bugtraq][snort] SNMP public access udp	2005-02-05 16:46:35	192.168.2.2.32005	192.168.2.4.161	UDP
#8 (1230)	[eve][icat][eve][icat][bugtraq][bugtraq][bugtraq][snort] SNMP request udp	2005-02-05 16:46:35	192.168.2.2.32005	192.168.2.4.161	UDP
#9 (1197)	[eve][icat][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 (1169)	[arachNIDS][snort] DDOS sha1 handler to agent	2005-02-05 16:46:16	192.168.2.2.1024	192.168.2.4.18753	UDP
#11 (1156)	nessus[snort] MS-SQL ping attempt	2005-02-05 16:46:12	192.168.2.2.32699	192.168.2.4.1434	UDP
#12 (1155)	[snort] (spo_b) Back Office Traffic detected	2005-02-05 16:46:11	192.168.2.2.32699	192.168.2.4.31337	UDP
#13 (1154)	nessus[snort] MISC AFS access	2005-02-05 16:46:08	192.168.2.2.32699	192.168.2.4.7001	UDP
#14 (1153)	nessus[snort] MISC AFS access	2005-02-05 16:46:07	192.168.2.2.32699	192.168.2.4.7001	UDP
#15 (1149)	nessus[snort] MISC AFS access	2005-02-05 16:46:06	192.168.2.2.32699	192.168.2.4.7001	UDP
#16 (1150)	[arachNIDS][snort] DDOS Trind0 Master to Daemon default password attempt	2005-02-05 16:46:06	192.168.2.2.1024	192.168.2.4.27444	UDP
#17 (1151)	[snort] SCAN Amanda client version request	2005-02-05 16:46:05	192.168.2.2.32096	192.168.2.4.10000	UDP
#18 (1152)	[snort] SCAN Amanda client version request	2005-02-05 16:46:05	192.168.2.2.32699	192.168.2.4.10001	UDP
#19 (1148)	[snort] SCAN Amanda client version request	2005-02-05 16:46:05	192.168.2.2.32696	192.168.2.4.10000	UDP
#20 (1130)	[eve][icat][bugtraq][snort] SNMP missing community string attempt	2005-02-05 16:45:54	192.168.2.2.32871	192.168.2.4.161	UDP
#21 (1131)	[eve][icat][eve][icat][bugtraq][bugtraq][bugtraq][snort] SNMP request udp	2005-02-05 16:45:54	192.168.2.2.32871	192.168.2.4.161	UDP

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The screenshot shows the Snort.org website in a Microsoft Internet Explorer browser. The page title is "Snort.org - The Open Source Network Intrusion Detection System". The main content area is titled "Snort Signature Database" and displays details for rule 1.1443. The rule is named "TFPT GET passwd". The rule signature is: alert udp any any -> any @ (msg "TFPT GET passwd", content "00 01", depth 2, content "passwd", offset 2, nocase, classtype:successful-admin, md5:1443, rev:4).

Summary: This event is generated when a TFPT 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 TFPT 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 TFPT it is normally an indication of a system compromise.

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

Affected Systems: None known.

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

False Positives: This rule was created to catch TFPT GET requests for "passwd", if this name is being used during a legitimate TFTP session this rule will generate a false positive. If you think this rule has a false positive, please help fill it out.

False Negatives: None known. If you think this rule has a false negative, please help fill it out.

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

The screenshot shows the Basic Analysis and Security Engine (BASE) alert interface. The alert is titled "Alert #1" and is triggered by the signature "TFPT GET passwd". The alert was triggered on 2005-02-05 at 16:47:15. The sensor used is 192.168.2.2 on the eth0 interface.

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

Meta:

name	interface	filter
Sensor	192.168.2.2	eth0

Alert Group: none

IP:

source addr	dest addr	Ver	Hdr Len	TOS	length	ID	flags	offset	TTL	chksum
192.168.2.2	192.168.2.4	4	5	0	80	5449	0	0	64	40987

Options: none

UCP:

source port	dest port	length
32905	69	30

Payload: length = 22
000 : 80 01 2E 2F 65 74 63 2F 70 61 73 73 77 64 00 ... /etc/passwd.
010 : 6F 63 74 65 74 00 octet.

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