USENIX'04 / UseBSD

Using OpenBSD and Snort to build ready to roll Network Intrusion Detection System Sensor

http://www.mycert.org.my/sensor/

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About Speaker

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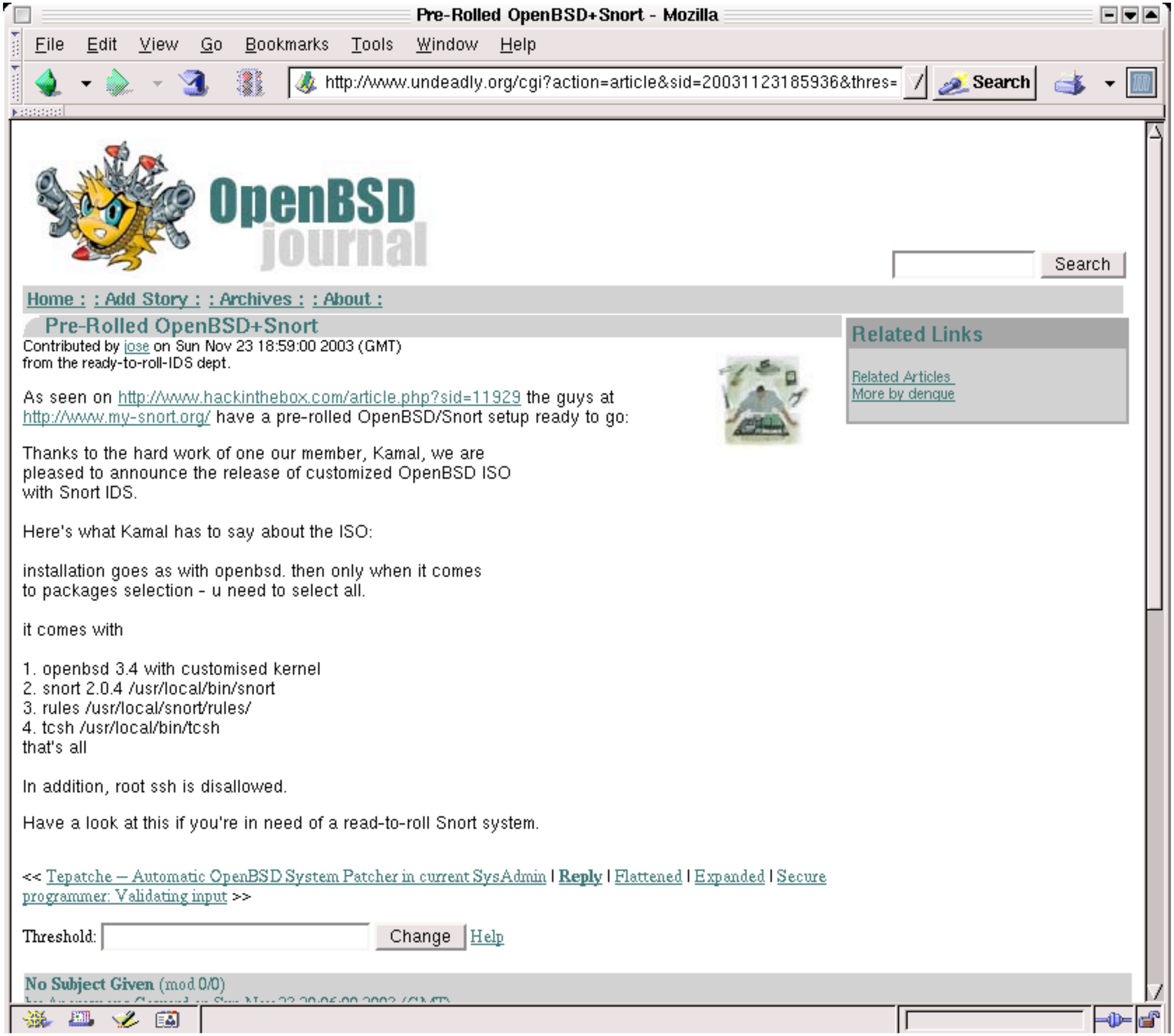
Agenda

- Overview of OpenBSD and Snort
- Deployment of Distributed Network Intrusion Detection System
- Building OpenBSD and Snort for Network Intrusion Detection System Sensor (x86)
- Wrap up (Ready To Roll)

Problem Statement

- We need to install / deploy multiple Network Intrusion Detection System (NIDS) sensor within our network.
- Basically – the sensor is scattered around and need that fast!
- We need to deploy for partner (case to case basis)

Motivation


Pre-Rolled OpenBSD+Snort - Mozilla
File Edit View Go Bookmarks Tools Window Help
http://www.undeadly.org/cgi?action=article&sid=20031123185936&thres=
Search
OpenBSD journal
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Pre-Rolled OpenBSD+Snort

Contributed by jose on Sun Nov 23 18:59:00 2003 (GMT)
from the ready-to-roll-IDS dept.

As seen on http://www.hackinthebox.com/article.php?sid=11929 the guys at http://www.my-snort.org/ have a pre-rolled OpenBSD/Snort setup ready to go:

Thanks to the hard work of one our member, Kamal, we are pleased to announce the release of customized OpenBSD ISO with Snort IDS.

Here's what Kamal has to say about the ISO:

installation goes as with openbsd. then only when it comes to packages selection - u need to select all.

it comes with

1. openbsd 3.4 with customised kernel
2. snort 2.0.4 /usr/local/bin/snort
3. rules /usr/local/snort/rules/
4. tcsh /usr/local/bin/tcsh

that's all

In addition, root ssh is disallowed.

Have a look at this if you're in need of a read-to-roll Snort system.

<< Tepatche – Automatic OpenBSD System Patcher in current SysAdmin | **Reply** | Flattened | Expanded | Secure programmer: Validating input >>

Threshold: Change Help

No Subject Given (mod 0/0)

OpenBSD

- BSD code base maturity.
- “Secure By Default”.
- Support for Internet infrastructure.
- Easy distribution sets.
- http://www.openbsd.org

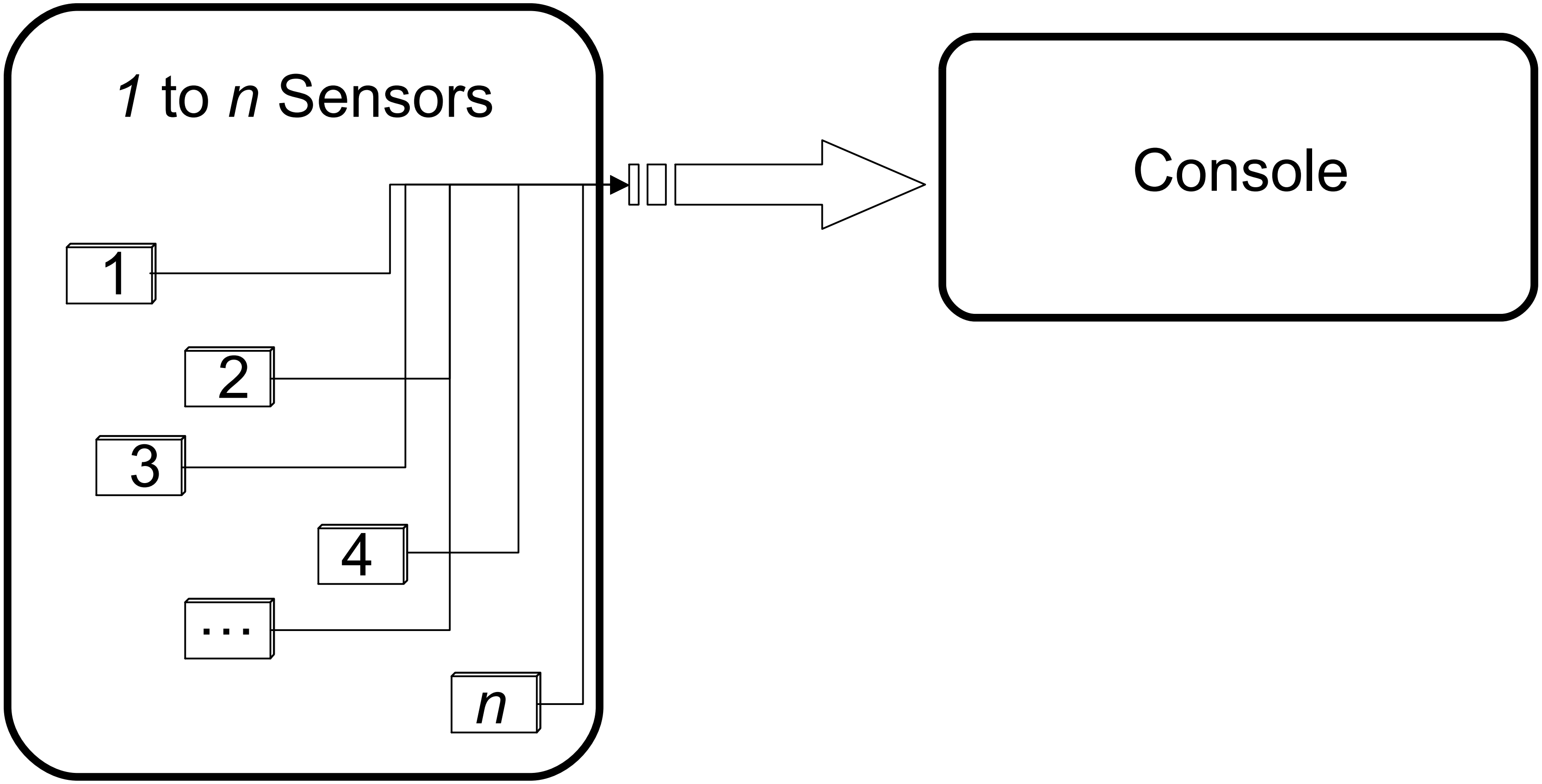
Snort

- Most notably Network Intrusion Detection System.
- Community signature support.
- Portable and configurable.
- http://www.snort.org

NIDS Sensor

- As an agent - it analyzes network packets in real time and compares them against a database of known 'attack signatures' or patterns.
- It will push the ‘data’ into remote database.

Distributed NIDS Generic Concept



Typical Installation

1. Install OpenBSD.
2. Tweak a kernel for performance tuning.
3. Install required third party software – MySQL client and PCRE.
4. Compile Snort with MySQL support and Snort related stuff - Barnyard, Stunnel, signature, user and group.
5. Take out unnecessary stuff.
6. Putting “in house” scripts.
7. Host hardening process.

Problem

- Time consume.
- Geographical boundary?
- Imagine when you need to roll 8 sensor?

Our approach

- Build one – install many.
- Installation process will cover all.
- Ideal sensor:
  - Performance
  - Minimal OS
  - No un-needed component
- Easy distribution – just iso / cdrom.

Building A Release

1. Install OpenBSD

   - extract sys.tar.gz into /usr/src/

   - cvs

2. Customise your kernel

   - /usr/src/sys/arch/i386/conf/MYKERNEL

3. Test your kernel

   - replace, reboot and monitor

Building A Release (cont)

4. Hacking the code

- You need to know the system.
- With this you can decide what you want.
- Code
    - /usr/src/Makefile
    - /usr/src/etc/Makefile
    - /usr/src/usr/bin/Makefile
    - ……..

Building A Release (cont)

/usr/src/etc/Makefile

```
--- Makefile.ori       Tue Jun 15 17:14:20 2004
+++ Makefile    Thu Jun 17 16:20:51 2004
@@ -1,7 +1,7 @@
 #     $OpenBSD: Makefile,v 1.201 2004/02/29 18:02:14 deraadt Exp $
  TZDIR=        /usr/share/zoneinfo
-LOCALTIME=    Canada/Mountain
+LOCALTIME=    Asia/Kuala_Lumpur
  NOOBJ= oobj
 @@ -17,8 +17,8 @@
-      phones printcap protocols rbootd.conf rc rc.conf rc.local \
-      rc.securelevel rc.shutdown remote rpc security services \
+       protocols rbootd.conf rc rc.conf rc.local \
+       rc.securelevel rc.shutdown remote security services \
```

Building A Release (cont)

/usr/src/etc/etc.i386/Makefile.inc

```
--- Makefile.inc.ori    Tue Jun 15 17:16:53 2004
+++ Makefile.inc        Tue Jun 15 17:17:20 2004
@@ -3,12 +3,12 @@
 .ifdef DESTDIR
 snap_md: bsd notes bootblocks distrib
-       cp ${.CURDIR}/../sys/arch/i386/compile/GENERIC/bsd \
+       cp ${.CURDIR}/../sys/arch/i386/compile/SENSOR/bsd \
            ${DESTDIR}/snapshot/bsd
 bsd:
-       cd ${.CURDIR}/../sys/arch/i386/conf && config GENERIC
-       cd ${.CURDIR}/../sys/arch/i386/compile/GENERIC && \
+       cd ${.CURDIR}/../sys/arch/i386/conf && config SENSOR
+       cd ${.CURDIR}/../sys/arch/i386/compile/SENSOR && \
            ${MAKE} clean && ${MAKE} depend && exec ${MAKE}
 notes:
```

Building A Release (cont)

5. Build process configuration

- make your building runs faster
- /etc/mk.conf

```
SKIPDIR=usr.sbin/httpd share/doc share/dict games kerberosV gnu/egcs sys/netinet6 distrib/alpha
distrib/amd64 distrib/cats distrib/hp300 distrib/hppa distrib/mac68k distrib/macppc distrib/mvme68k
distrib/mvme88k distrib/mvmeppc distrib/sparc distrib/sparc64 distrib/vax share/man gnu/usr.bin/perl
gnu/usr.bin/perl/lib gnu/usr.sbin/sendmail etc/etc.alpha etc/etc.amd64 etc/etc.cats etc/etc.hp300
etc/etc.hppa etc/etc.mac68k etc/etc.macppc etc/etc.mvme68k etc/etc.mvme88k etc/etc.mvmeppc
etc/etc.sparc etc/etc.sparc64 etc/etc.svr4 etc/etc.vax sys/arch/alpha sys/arch/amd64 sys/arch/arm
sys/arch/cats sys/arch/hp300 sys/arch/hppa sys/arch/m68k sys/arch/mac68k sys/arch/macppc
sys/arch/mvme68k sys/arch/mvme88k sys/arch/mvmeppc sys/arch/pegasos sys/arch/powerpc
sys/arch/sparc sys/arch/sparc64 sys/arch/vax
```

Building A Release (cont)

6. Build your system

- /usr/src ; make obj && make build

7. Making your system

- setenv for RELEASEDIR and DESTDIR
- /usr/src/etc ; make release

Building A Release (cont)

/usr/src/distrib/sets/maketars

```
--- maketars.old       Wed Jun 16 18:55:32 2004
+++ maketars    Sat Jun 19 09:21:38 2004
@@ -49,7 +49,7 @@

 cd $fsdir

-for i in base comp etc game man misc; do
+for i in base etc ; do
        echo -n "$i: "
        cat ${lists}/$i/mi ${lists}/$i/md.${arch} | sort | \
            pax -w -d | gzip -9 > ${tardir}/$i${RELEASE}.tgz
```

Building A Release (cont)

8. Release tarballs

- RELEASEDIR should contain binary distribution sets, kernel, cdrom and floopy bootable file-systems, checksum file and installation instruction.

9. Adding third party software

- uses siteXX.tgz
- example:

```
/usr/local/lib/libpcre.so.0.1
/usr/local/lib/libmysqlclient.so.12.0
/usr/local/bin/snort
/usr/local/bin/barnyard
/usr/local/sbin/stunnel
/etc/rules/
/var/log/snort
```

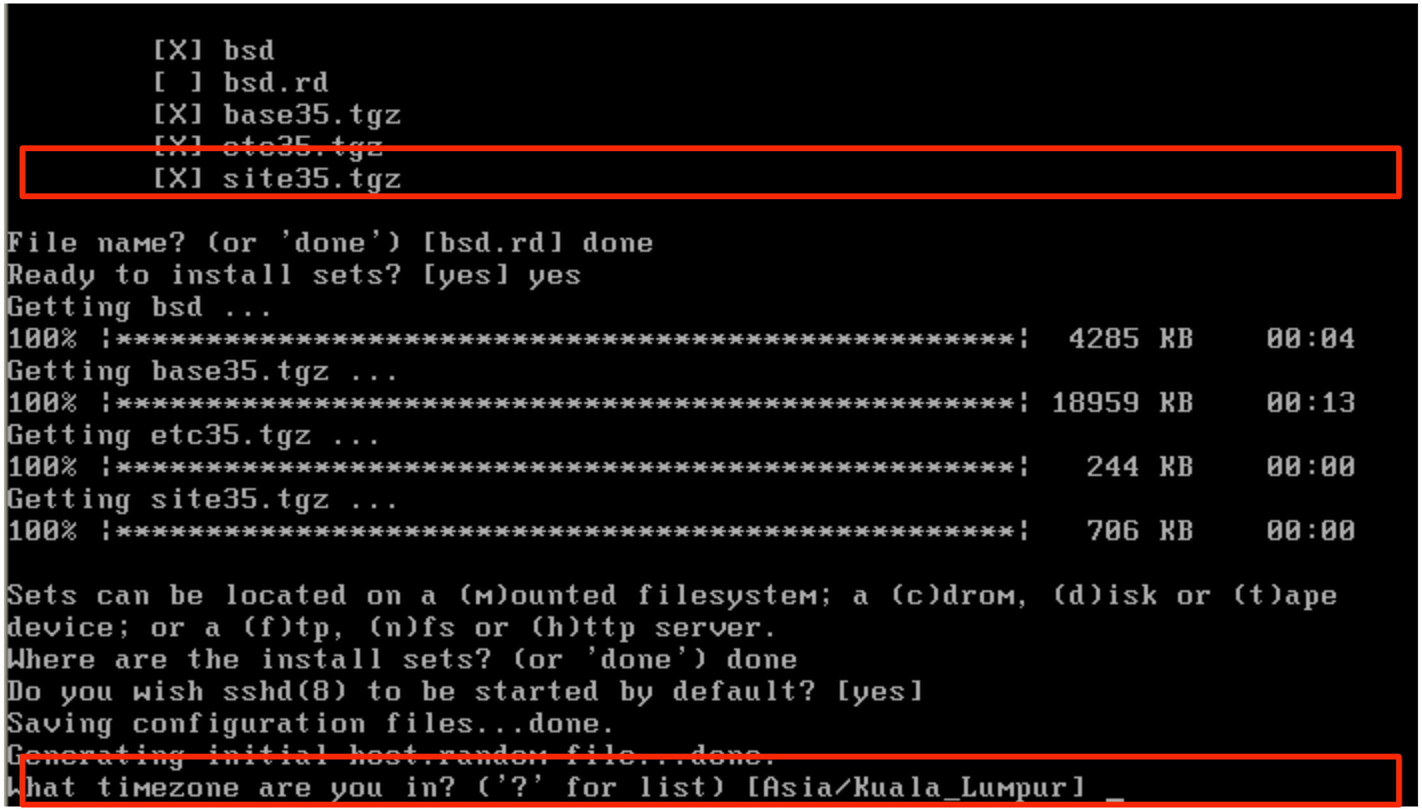
Build A Release (cont)

10. Write your iso

    - follow the layout set ie: /version/arch/
    - mkhybrid

11. Distribute your iso or cdrom

Installation



```
        [X] bsd
        [ ] bsd.rd
        [X] base35.tgz
        [X] etc35.tgz
        [X] site35.tgz

File name? (or 'done') [bsd.rd] done
Ready to install sets? [yes] yes
Getting bsd ...
100% |**************************************************|  4285 KB    00:04
Getting base35.tgz ...
100% |**************************************************| 18959 KB    00:13
Getting etc35.tgz ...
100% |**************************************************|   244 KB    00:00
Getting site35.tgz ...
100% |**************************************************|   706 KB    00:00

Sets can be located on a (m)ounted filesystem; a (c)drom, (d)isk or (t)ape
device; or a (f)tp, (n)fs or (h)ttp server.
Where are the install sets? (or 'done') done
Do you wish sshd(8) to be started by default? [yes]
Saving configuration files...done.
Generating initial host.random file...done.
What timezone are you in? ('?' for list) [Asia/Kuala_Lumpur] _
```

Our Release

- Uses around 50M.
- Default installation with:
  - Snort, its dependency, signature, directory, user and group
  - Barnyard, Stunnel
- Has our own “in house” script.
- Sample release:
  - http://www.my-snort.org/downloads/
  - http://www.mycert.org.my/sensor/

Virtual PC demo

Maintenance

- Central server
- Second NIC is controlled by TCP-Wrapper and SSH-key
- All rules are 'cvs’
- Application / Snort upgrade use pkg_add

How To

- Collection of howto is
  - http://www.openbsd.org/faq/index.html
  - Man release
    - building an OpenBSD release
  - Man mk.conf
    - system-specific configuration parameters
  - misc@openbsd.org

Similar Project

http://www.prowling.nu/main/openids/openids.html

Conclusion

- We are still working on making a small distribution.
- Room for improvement.

end()

Thank You for Listening