Introduction

outdated, new installations here Tired of Systemd and some other layers in Linux, I will try to install OpenBSD my x230 Tablet, encrypting partitions with a key stored on a SD card. (hello NSA)
I will use an openBSD59 (snapshot of 27th of March 2016).
The x230 is modified, I added a mSATA drive (sd1).
I removed totally Windows as I don't use it.

Downloads

Install59.iso

disk Layout

I will use the following schema:

- mSATA (sd1) 256GB for /
- SATA (sd0) 500GB for swap/var/home

Disk	Partition	Format	Size	Mount Point
1	1	RAID	230GB	/
1	2	none	26GB	fake trim
0	1	swap	16GB	OpenBSD swap
0	2	RAID	480GB	/var, /tmp and /home

Installation

Boot from the iso/usb key
Select the shell (by type 's') when arriving on the following:
(I)nstall, (U)pgrade, (A)utoinstall, (S)hell?

Disk partitionning

We will create the above partitions using fdisk/disklabel tools.

```
fdisk -iy sd1
```

the output is

```
fdisk ; sd1: No such file or directory
```

Let's create the device

```
cd /dev
sh ./MAKEDEV sd1
```

An run again:

```
fdisk -iy sd1
```

the output is largely nicer:

```
Writing MBR at offset 0.
```

Let's partition sd0 and sd1

```
disklabel -E sd1
> a
partition: [a]
offset: [64]
size: [500103386] 95%
FS type: [4.2BSD] RAID
> w
> q
```

Done for sd1 (I leave 5% free for TRIM as I got no clear details whether or not I need it or not if it is working or not and well 95% of 256GB should be enough for / 🙂)
Let's partition sd0

```
disklabel -E sd0
> a
partition: [a]
offset: [0]
size: [976773168] 16g
FS type: [4.2BSD] swap
> a
partition: [b]
offset: [33559785]
size: [943213383]
FS type: [swap] RAID
> w
> q
```

Here we do 2 partitions, swap (already encrypted) and a RAID one that will contained /var /tmp and /home)

SDcard/USBkey partitioning

Plug in your SD card/ USB stick, here it is named sd3

```
cd /dev
sh ./MAKEDEV sd3
```

Don't forget to create the MBR

```
 fdisk -iy sd3
```

We just need around 1MB for the key so I will just create two very small partitions (d and e).

```
disklabel -E sd3
> a
partition: [a]d
offset: [64]
size: [124735488] 2m
FS type: [4.2BSD] RAID
> a
partition: [a]e
offset: [16065]
size: [124735488] 2m
FS type: [4.2BSD] RAID
> w
> q
```

Let's encrypt

So for now we have sd1(m-sata)/sd0(sata)/sd2(sdcard)
Next step is an all-in-one step: we will encrypt sd1a and sd0b as softraid0 and save the key on the SD card.

```
bioctl -C force -c C -l /dev/sd1a -k /dev/sd3d softraid0
bioctl -C force -c C -l /dev/sd0b -k /dev/sd3e softraid0
```

Note: http://www.tedunangst.com/flak/post/OpenBSD-softraid-crypto-boot
Maybe it would be good to put on top:

```
bioctl -c C -l /dev/sd1a -r 98765 softraid0
bioctl -c C -l /dev/sd0b -r 98765 softraid0
```

Output will be something like:

```
sd4 at scsibus2 targ 1 lun 0: <OPENBSD, SR CRYPTO, 005> SCSI2 0/direct fixed
sd4: 231988MB,512 bytes/sector, 475111754 sectors
```

and

```
sd5 at scsibus2 targ 2 lun 0: <OPENBSD, SR CRYPTO, 005> SCSI2 0/direct fixed
sd5: 460553MB,512 bytes/sector, 943212855 sectors
```

We create the devices:

```
cd /dev
sh ./MAKEDEV sd4
sh ./MAKEDEV sd5
```

Good practice, erase first MegaByte:

```
dd if=/dev/zero of=/dev/rsd4c bs=1m count=1
dd if=/dev/zero of=/dev/rsd5c bs=1m count=1
```

So now we have sd4 and sd5 which we will use during the installation.

Install

Let's go back to the installation

```
/install
```

Select layout, timezone, passwords, user(s)…
When at the partitioning point, select the 2 new device (sd4 and sd5 in my case).

```
Which disk is the root disk? [sd0] sd4
Use (W)hole disk MBR, whole disk (G)PT or (E)dit? [whole]W
[… auto partitions schema …]
Use (A)uto layout, (E)dit auto layout, or create (C)ustom layout? [a] c
> a
partition: [a]a
offset: [64]
size: [475106246]
FS type: [4.2BSD]
mount point: [none] /
> w
> q
```

We do the same for sd5 (/var /tmp and /home)

```
which disk do you wish to initialize? [done] sd5
Use (W)hole disk MBR, whole disk (G)PT or (E)dit? [whole]W
> a
partition: [a]a
offset: [64]
size: [943208216] 20g
```

```
FS type: [4.2BSD]
mount point: [none] /var
> a
partition: [b]
offset: [41945696]
size: [901262584] 10g
FS type: [swap] 4.2BSD
mount point: [none] /tmp
> a
partition: [d]
offset: [62910528]
size: [880297752]
FS type: [4.2BSD]
mount point: [none] /home
> w
> q
```

And voilà.

```
which disk do you wish to initialize? [done]
```

Install the sets
Installation should finish with a success, but **DO NOT REBOOT YET**

Final touch

We will tweak quickly the fstab to add the swap partition as well as some parameters:

```
sed 's/rw/rw,softdep,noatime/g' /mnt/etc/fstab > /mnt/a
echo '/dev/sd0a none swap sw 0 0' >> /mnt/a
mv /mnt/a /mnt/etc/fstab
```

Done, everything is ready! ready to reboot

```
reboot
```

Backup of the Keys

```
dd if=/dev/rsd2d of=key1.img bs=1m
dd if=/dev/rsd2e of=key2.img bs=1m
```

Switching to -current

Optional, but thrilling!

```
cd /
mv /bsd.rd /bsd.rd.sav
wget http://mirror.switch.ch/ftp/pub/OpenBSD/snapshots/amd64/bsd.rd
```

Reboot

```
reboot
```

At boot prompt type:

```
boot> boot bsd.rd
```

Then use the “upgrade” method, give your keyboard layout, your root device/partition.
When upgrade is done, type again “reboot”.
Once reboot use sysmerge to merge/check modifications

```
sysmerge
```

And voilà ! you are in -current

Laptop tweaks

apm

In order to keep some battery:

```
vi /etc/rc.conf.local
```

add

```
apmd_flags="-A"         # Set apmd(8) to automatic performance adjustment
mode.
apmd_enable="YES"
```

desktop reactivity

In /etc/rc.conf.local add:

```
multicast_host=YES
ntpd_flags="-s"
hotplugd_flags=""
```

In /etc/login.conf change:

```
        :datasize-max=512M:\
        :datasize-cur=512M:\
```

by (at least)

```
        :datasize-max=1024M:\
        :datasize-cur=1024M:\
```

Reference: http://www.bsdnow.tv/tutorials/the-desktop-obsd

Xorg

xorg.conf to put in /etc/X11

```
Section "ServerLayout"
    Identifier     "X.org Configured"
    Screen      0  "Screen0" 0 0
    InputDevice    "Mouse0" "CorePointer"
    InputDevice    "Keyboard0" "CoreKeyboard"
   Option         "AllowEmptyInput" "off"
    Option            "AutoAddDevices" "off"
   Option         "DontZap" "false"
EndSection

Section "Files"
    ModulePath   "/usr/X11R6/lib/modules"
    FontPath     "/usr/X11R6/lib/X11/fonts/misc/"
    FontPath     "/usr/X11R6/lib/X11/fonts/TTF/"
    FontPath     "/usr/X11R6/lib/X11/fonts/OTF/"
    FontPath     "/usr/X11R6/lib/X11/fonts/Type1/"
    FontPath     "/usr/X11R6/lib/X11/fonts/100dpi/"
    FontPath     "/usr/X11R6/lib/X11/fonts/75dpi/"
EndSection

Section "Module"
    Load  "dbe"
    Load  "dri"
    Load  "dri2"
    Load  "extmod"
    Load  "glx"
    Load  "record"
EndSection
```

```
Section "InputDevice"
    Identifier  "Keyboard0"
    Driver      "kbd"
        Option "XkbLayout" "us"
        Option "XkbVariant" "intl"
# Option "XkbOptions "compose:prsc"
EndSection

Section "InputDevice"
    Identifier    "Touchpad0"
    Driver        "synaptics"
    Option        "Device" "/dev/wsmouse0"
    Option        "AutoServerLayout" "True"
EndSection

Section "InputDevice"
    Identifier  "Mouse0"
    Driver      "mouse"
    Option        "Protocol" "wsmouse"
    Option        "Device" "/dev/wsmouse"
    Option        "ZAxisMapping" "4 5 6 7"
    Option        "EmulateWheel" "true"
    Option        "EmulateWheelButton" "2"
    Option        "AutoServerLayout" "True"
EndSection

Section "Monitor"
    Identifier   "Monitor0"
    VendorName   "Monitor Vendor"
    ModelName    "Monitor Model"
EndSection

Section "Device"
        ### Available Driver options are:-
        ### Values: <i>: integer, <f>: float, <bool>: "True"/"False",
        ### <string>: "String", <freq>: "<f> Hz/kHz/MHz",
        ### <percent>: "<f>%"
        ### [arg]: arg optional
        #Option     "NoAccel"            # [<bool>]
        #Option     "SWcursor"           # [<bool>]
        #Option     "ColorKey"           # <i>
        #Option     "CacheLines"         # <i>
        #Option     "Dac6Bit"            # [<bool>]
        #Option     "DRI"                # [<bool>]
        #Option     "NoDDC"              # [<bool>]
        #Option     "ShowCache"          # [<bool>]
        #Option     "XvMCSurfaces"       # <i>
        #Option     "PageFlip"           # [<bool>]
    Identifier  "Card0"
    Driver      "intel"
```

```
    BusID       "PCI:0:2:0"
EndSection

Section "Screen"
    Identifier "Screen0"
    Device     "Card0"
    Monitor    "Monitor0"
    SubSection "Display"
        Viewport   0 0
        Depth     16
    EndSubSection
    SubSection "Display"
        Viewport   0 0
        Depth     24
    EndSubSection
EndSection
```

Touchpad

See xorg.conf above but basically:

```
Section "InputDevice"
    Identifier    "Touchpad0"
    Driver        "synaptics"
    Option        "Device" "/dev/wsmouse0"
    Option        "AutoServerLayout" "True"
EndSection

Section "InputDevice"
    Identifier  "Mouse0"
    Driver      "mouse"
    Option        "Protocol" "wsmouse"
    Option        "Device" "/dev/wsmouse"
    Option        "ZAxisMapping" "4 5 6 7"
    Option        "EmulateWheel" "true"
    Option        "EmulateWheelButton" "2"
    Option        "AutoServerLayout" "True"
EndSection
```

In your ~/.xsession

```
#!/bin/sh

# deactivate touchpad
synclient TouchpadOff=1
```

Scrolling

Still in ~/.xsession

```
# activate scroll wheel button
xinput set-prop "/dev/wsmouse" "WS Pointer Wheel Emulation" 0
xinput set-prop "/dev/wsmouse" "WS Pointer Wheel Emulation Axes" 6 7 4 5
xinput set-prop "/dev/wsmouse" "WS Pointer Wheel Emulation Button" 2
xinput set-prop "/dev/wsmouse" "WS Pointer Wheel Emulation Timeout" 50
xinput set-prop "/dev/wsmouse" "WS Pointer Wheel Emulation Inertia" 3

# increase pointer speed
xinput set-prop "/dev/wsmouse" "Device Accel Constant Deceleration" 0.4
```

Locales

Still in ~/.xsession

```
# set locale
export LC_CTYPE="en_US.UTF-8"
export LC_MESSAGES="en_US.UTF-8"
```

Network

ifconfig is your friend!
Simple example:

```
ifconfig iwn0 nwid "my nice wifi" wpakey "4m4z1ngP4$$" up
```

then if all is ok:

```
dhclient iwn0
```

You can scan networks (wifi)

```
ifconfig iwn0 scan
```

Failover network

local DNS

Security

PF

Basic rules in your /etc/pf.conf

```
#       $OpenBSD: pf.conf,v 1.54 2014/08/23 05:49:42 deraadt Exp $
#
# See pf.conf(5) and /etc/examples/pf.conf

set skip on lo

block return    # block stateless traffic
pass            # establish keep-state

# By default, do not permit remote connections to X11
block return in on ! lo0 proto tcp to port 6000:6010

set block-policy drop
match in all scrub (no-df random-id max-mss 1440)
antispoof quick for (egress)
block in quick on egress from { no-route urpf-failed } to any
block in all
pass out quick inet keep state
```

References: http://www.bsdnow.tv/tutorials/the-desktop-obsd

Additional Packages

Time to play with pkg_add to put some useful tools:

```
pkg_add -Uu
pkg_add -iv firefox
pkg_add -iv ImageMagick irssi vim zsh rxvt-unicode fvwm2 xscreensaver
rdesktop iftop rsync wget curl figlet dfc git subversion ranger emelfm2
```

Ports

You can install ports using a snapshot made for you!

```
cd /usr
wget http://mirror.switch.ch/ftp/pub/OpenBSD/snapshots/ports.tar.gz
tar xvzf ports.tar.gz
```

Finding packages

Two ways:

```
pkg_info yourpackage
```

or

```
cd /usr/ports
make search key=what_you_search
```

Reference: http://www.bsdnow.tv/tutorials/ports-obsd

Thing went wrong when

bootblocks are not installed

```
→ installboot: no OpenBSD partition
Failed to install bootblocks
You will not be able to boot OpenBSD from sd4
```

I had this issue when sd0 didn't had a MBR nor sd3 … dd saved the days :)

References

- http://unix.stackexchange.com/questions/9527/how-should-one-set-up-full-disk-encryption-on-openbsd
- https://ryanak.ca/planet-ubuntu/2013/03/26/Setting-up-full-disk-encryption-in-OpenBSD-5.3.html
- http://geekyschmidt.com/2011/01/19/configuring-openbsd-softraid-fo-encryption
- http://brycv.com/blog/2012/encrypted-root-filesystem-using-softraid-4-on-openbsd-with-an-slc-ssd/
- http://www.bsdnow.tv/tutorials/fde
- http://man.openbsd.org/OpenBSD-current/man8/bioctl.8
- http://geodsoft.com/howto/harden/OpenBSD/no_changes.htm
- http://fsfe.soup.io/post/669752294/emergency-exit-OpenBSD-on-the-Thinkpad-X250
- http://www.openbsd.org/faq/faq4.html
- http://undeadly.org/cgi?action=article&sid=20110530221728

- https://github.com/jhautefeuille/obsdnfo
- http://www.openbsd.org/faq/faq14.html
- http://geekyschmidt.com/2011/03/27/openbsd-laptop-mini-howto
- http://www.tumfatig.net/20150215/bind-nsd-unbound-openbsd-5-6/
- http://www.openbsd.org/faq/faq6.html

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