

Debian

References

OpenWRT packages: <http://bartekk.pdg.pl/openwrt/>

<http://forum.nas-central.org/viewtopic.php?f=249&t=5145>

<http://eko.one.pl/?p=openwrt-nsa310>

<https://sites.google.com/site/realblades/misc/debian-on-zyxel-nsa310>

http://linuxwiki.de/ZYXEL%20NSA-310#Debian_Installation

<http://openrouter.info/forum/viewtopic.php?f=19&t=1581&start=80>

Preparation

First install Debian 6 (squeeze). Put on FAT formatted pendrive: [initrd.gz](#) [ulmage-3.2](#) [ulmage-3.5.1](#)

then boot from pendrive (one time, without saving it permanently to u-boot environment) Machine type is [4022](#)

```
setenv arcNumber 4022
setenv mainlineLinux yes
usb start
fatload usb 0 0x800000 /uImage-3.2
fatload usb 0 0xb00000 /initrd.gz
setenv bootargs 'console=ttyS0,115200 root=/dev/ram
initrd=0xb00000,0x900000 ramdisk=32768'
bootm 0x800000
```

and install Debian 6 system as usual. Installer will complain about no matching modules and no matching kernel. During installation, create small /boot ext3 partition for kernels.

To boot from HDD, copy ulmage-3.2 from pendrive to HDD /boot partition and set u-boot:

From u-boot console, test partitions readability:

```
ide reset
ide part
ext2ls ide 0:1
ext2ls ide 0:3
```

In my example I got following partitions numbers:

Partition Map for IDE device 0 -- Partition Type: DOS

Partition	Start Sector	Num Sectors	Type
1	309248	19222528	83
2	19533822	957237250	5 Extd
3	2048	307200	83

Where 3rd partition is small /boot partition, so we need to load kernel from 'ide 0:3'

```
setenv arcNumber 4022
setenv mainlineLinux yes
setenv bootargs 'console=ttyS0,115200 root=/dev/sda1'
setenv bootcmd 'ide reset; ext2load ide 0:3 0x800000 /uImage-3.2; bootm
0x800000'
saveenv
reset
```

or 3.5.1 kernel:

```
setenv bootcmd 'ide reset; ext2load ide 0:3 0x800000 /uImage-3.5.1;
bootm 0x800000'
```

Update to Debian Wheezy

Put following sources into /etc/apt/sources.list

```
##### Debian Main Repos
deb http://ftp.pl.debian.org/debian/ wheezy main contrib non-free
deb-src http://ftp.pl.debian.org/debian/ wheezy main contrib non-free

##### Debian Update Repos
deb http://security.debian.org/ wheezy/updates main contrib non-free
deb http://ftp.pl.debian.org/debian/ wheezy-proposed-updates main contrib
non-free
deb-src http://security.debian.org/ wheezy/updates main contrib non-free
deb-src http://ftp.pl.debian.org/debian/ wheezy-proposed-updates main
contrib non-free
```

```
apt-get update
apt-get dist-upgrade

apt-get install linux-base firmware-realtek
apt-get clean
```

Fine tuning

Install missing packages:

```
apt-get install uboot-envtools smartmontools strace watchdog hdparm
```

Generate blank modules.dep

```
mkdir /lib/modules/3.5.1  
depmod -a
```

LEDs

To turn ON System LED (disable blinking) please add line to /etc/rc.local:

```
echo 1 > /sys/class/leds/nsa310:green:System/brightness
```

uboot-envtools

Create /etc/fw_env.config with content:

/dev/mtd1	0x0000	0x20000	0x20000
4			

MAC address

After bootup, ethernet controller has MAC address '00:00:00:00:00:30'. There are several method to restore correct MAC address which can be obtained from u-boot env: 1) add to /etc/rc.local

```
ifdown eth0  
/sbin/ifconfig eth0 hw ether `fw_printenv -n ethaddr`  
ifup eth0
```

or

```
/sbin/ip link set eth0 address `/usr/bin/fw_printenv ethaddr | /bin/grep -E  
-o '[:xdigit:]]{2}(:[:xdigit:]]{2}){5}'`
```

2) add line to /etc/network/interfaces

```
hwaddress ether cc:5d:4e:c9:fc:06
```

3) Edit and set MAC here: `/etc/udev/rules.d/70-persistent-net.rules`

Wake-on-lan will work only with fake MAC '00:00:00:00:00:30'

Fix for alloc kernel panic

Add these lines in `/etc/sysctl.conf`:

```
# Set VM min memory
vm.min_free_kbytes=8192
```

Buttons

Ref: http://masu.6f.sk/index.php?title=Nsa310_buttons Button works, but requires long pressing > 1sec.

Fan

Detect PWM devices and calibrate fan RPMs using 'pwmconfig'. After many questions an tests the config file `/etc/fancontrol` will be generated.

```
# Configuration file generated by pwmconfig, changes will be lost
INTERVAL=10
DEVPATH=hwmon0=devices/platform/mv64xxx_i2c.0/i2c-0/0-002e
DEVNAME=hwmon0=lm85
FCTEMPS=hwmon0/device/pwm1=hwmon0/device/temp3_input
FCFANS= hwmon0/device/pwm1=hwmon0/device/fan1_input
MINTEMP=hwmon0/device/pwm1=35
MAXTEMP=hwmon0/device/pwm1=60
MINSTART=hwmon0/device/pwm1=16
MINSTOP=hwmon0/device/pwm1=16
MINPWM=hwmon0/device/pwm1=0
```

Features

- LM-Sensors are working. You can check values using command 'sensors'
- HDD temperature: `smartctl -A /dev/sda | awk '/^194/ {print $10}'`
- Should be possible to wake NSA310 (powered off by 'halt' command) sending Wake-On-Lan packet to NSA310 'wakeonlan 00:00:00:00:00:30'

Own kernel

There's no need to keep pestering the poor guy over simple config changes. It's easy to build your own kernel; the instructions are right there in the first post. On a debian host you need to add the emdebian repo and install gcc-4.7-arm-linux-gnueabi (or whatever version) and u-boot-tools to build the kernel.

I just built one with device mapper and crypto target support, and threw in netfilter NAT stuff for giggles.

Here it is: <http://allurgroceries.com/nsa310/ulmage-3.5.7> And the .config: http://allurgroceries.com/nsa310/config-3.5.7_nsa310_allurgroceries

Kernel 3.18

Download latest Jessie rootfs from: [Linux Kernel 3.18 \(FDT\) and 3.16 \(non-FDT\) Kirkwood package and rootfs](#)

Or locally: [linux-3.18.5-kirkwood-tld-1-bodhi.tar.bz2](#) [debian-3.18.5-kirkwood-tld-1-rootfs-bodhi.tar.bz2](#)

Unpack rootfs to media, can be USB pendrive for now.

```
cd /mnt/sdd1
tar -xjf Debian-3.18.5-kirkwood-tld-1-rootfs-bodhi.tar.bz2
```

Inside rootfs, there is /boot directory which contains bootable kernel, initrd and device trees. Go to newly unpacked roots directory and create images recognizable by u-boot. If command *mkimage* is missing, please install *u-boot-tools*.

Boot without Flattened Device Tree

This method is supported by old (stock) U-BOOT. In this case FDT structure is appended at end of kernel.

```
cd /boot
cp -a zImage-3.18.5-kirkwood-tld-1 zImage.fdt
cat dts/kirkwood-nsa310.dtb>> zImage.fdt

mkimage -A arm -O linux -T kernel -C none -a 0x00008000 -e 0x00008000 -n
Linux-3.18.5-kirkwood-tld-1 -d ./zImage.fdt ./uImage-3.18.5
mkimage -A arm -O linux -T ramdisk -C gzip -a 0x00000000 -e 0x00000000 -n
initramfs-3.18.5-kirkwood-tld-1 -d ./initrd.img-3.18.5-kirkwood-tld-1
./uInitrd-3.18.5
```

Test if kernel starts correctly from pendrive:

```
usb start
fatload usb 0 0x800000 /boot/uImage-3.18.5
fatload usb 0 0x1100000 /boot/uInitrd-3.18.5
bootm 0x800000 0x1100000
```

Boot from HDD (separate small /boot partition, so no /boot prefix in filenames):

```
ide reset
ext2load ide 0:3 0x800000 /uImage-3.18.5
ext2load ide 0:3 0x1100000 /uInitrd-3.18.5
bootm 0x800000 0x1100000
```

Boot with Flattened Device Tree

NOT SUPPORTED BY OLD (default U-BOOT)

```
cd boot
mkimage -A arm -O linux -T kernel -C none -a 0x00008000 -e 0x00008000 -n
Linux-3.18.5-kirkwood-tld-1 -d ./vmlinuz-3.18.5-kirkwood-tld-1
./uImage-3.18.5
mkimage -A arm -O linux -T ramdisk -C gzip -a 0x00000000 -e 0x00000000 -n
initramfs-3.18.5-kirkwood-tld-1 -d ./initrd.img-3.18.5-kirkwood-tld-1
./uInitrd-3.18.5
```

Test if kernel starts correctly from pendrive:

```
usb start
fatload usb 0 0x800000 /boot/uImage
fatload usb 0 0x1100000 /boot/uInitrd
fatload usb 0 0x1c00000 /boot/dts/kirkwood-nsa310.dtb
bootm 0x800000 0x1100000 0x1c00000
```

Boot from HDD (separate small /boot partition, so no /boot prefix in filenames):

```
ide reset
ext2load ide 0:3 0x800000 /uImage-3.18.5
ext2load ide 0:3 0x1100000 /uInitrd-3.18.5
ext2load ide 0:3 0x1c00000 /dts/kirkwood-nsa310.dtb
bootm 0x800000 0x1100000 0x1c00000
```

Adapt own devie tree file

There are multiple HW versions of NSA310 on market, but only 2 device tree are defined in kernel:

1. kirkwood-nsa310.dtb - all LEDs are bicolor (red and green), sensors device 'adt7476' on I2C bus
2. kirkwood-nsa310a.dtb - like above but without red USB led, and sensor device 'lm85'

My NSA310 version is like nsa310 but with lm85 :), so I've created [kirkwood-nsa310b.dts](#) based on kirkwood-nsa310.dts with LM85 section from kirkwood-nsa310a.dts.

```
apt-get install emdebian-archive-keyring
```

Debian Jessie

Above rootfs contains Jessie system for NSA325. To use it with NSA310 some changes are needed.

apt source

Adapt to your country location in */etc/apt/sources.list*, and add missing *contrib* and *non-free* packages

```
apt-get update
apt-get dist-upgrade
apt-get install firmware-realtek fancontrol lm-sensors
```

RAM disk will be regenerated, so you need to recreate *ulnitr-d-xxx* again.

Enable LEDs

Adapt */etc/rc.local* to own needs:

```
if [ -d /sys/class/leds/nsa310:green:sys ]; then
    echo default-on> /sys/class/leds/nsa310:green:sys/trigger
    echo none      > /sys/class/leds/nsa310:red:sys/trigger
fi

if [ -d /sys/class/leds/nsa310:green:hdd ]; then
    echo ide-disk1> /sys/class/leds/nsa310:green:hdd/trigger
fi

if [ -d /sys/class/leds/nsa310:green:esata ]; then
    echo ide-disk2> /sys/class/leds/nsa310:green:esata/trigger
fi

if [ -d /sys/class/leds/nsa310:green:usb ]; then
    echo usb-host> /sys/class/leds/nsa310:green:usb/trigger
fi
```

turn off HDD when idle

- by default busybox-syslogd is installed, with logging to RAM
- mount working dir for samba and dhcp client as tmpfs

- switch Samba to use syslog
- tune system /etc/sysctl.conf
- smartd from smartmontools writes it log and state to /var/lib/smartmontools
 - put it on tmpfs (and lose history)
 - or increase disc check interval in /etc/default/smartmontools

repair /etc/adjtime

add new line at end of /etc/adjtime

uboot-envtools

/etc/fw_env.config

/dev/mtd0	0x100000	0x20000	0x20000
4			

TODO

linux-headers-3.2.0-4-kirkwood - Header files for Linux 3.2.0-4-kirkwood linux-image-3.2.0-4-kirkwood - Linux 3.2 for Marvell Kirkwood linux-headers-2.6-kirkwood - Header files for Linux kirkwood configuration (dummy package) linux-headers-kirkwood - Header files for Linux kirkwood configuration (meta-package) linux-image-2.6-kirkwood - Linux for Marvell Kirkwood (dummy package) linux-image-kirkwood - Linux for Marvell Kirkwood (meta-package)

From:

<https://niziak.spox.org/wiki/> - **niziak.spox.org**

Permanent link:

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